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ENVIRONMENTAL IMPACT REPORT

LION'S GATE RESERVE

Lead Agency: County of Santa Clara

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March 1996

VOLUME III: TECHNICAL APPENDICES F through N

VOLUME III

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Biological Reports

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July 1989, August 1992 and November 1995

2) Center for Conservation Biology

July 1992 and December 1993

3) LSA Associates, Inc.

May 1994, December 1995 and March 1996

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ECOLOGICAL CONSULTANTS

HAYES VALLEY
BIOLOGICAL RESOURCES REPORT

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ENVIRONMENTAL SETTING

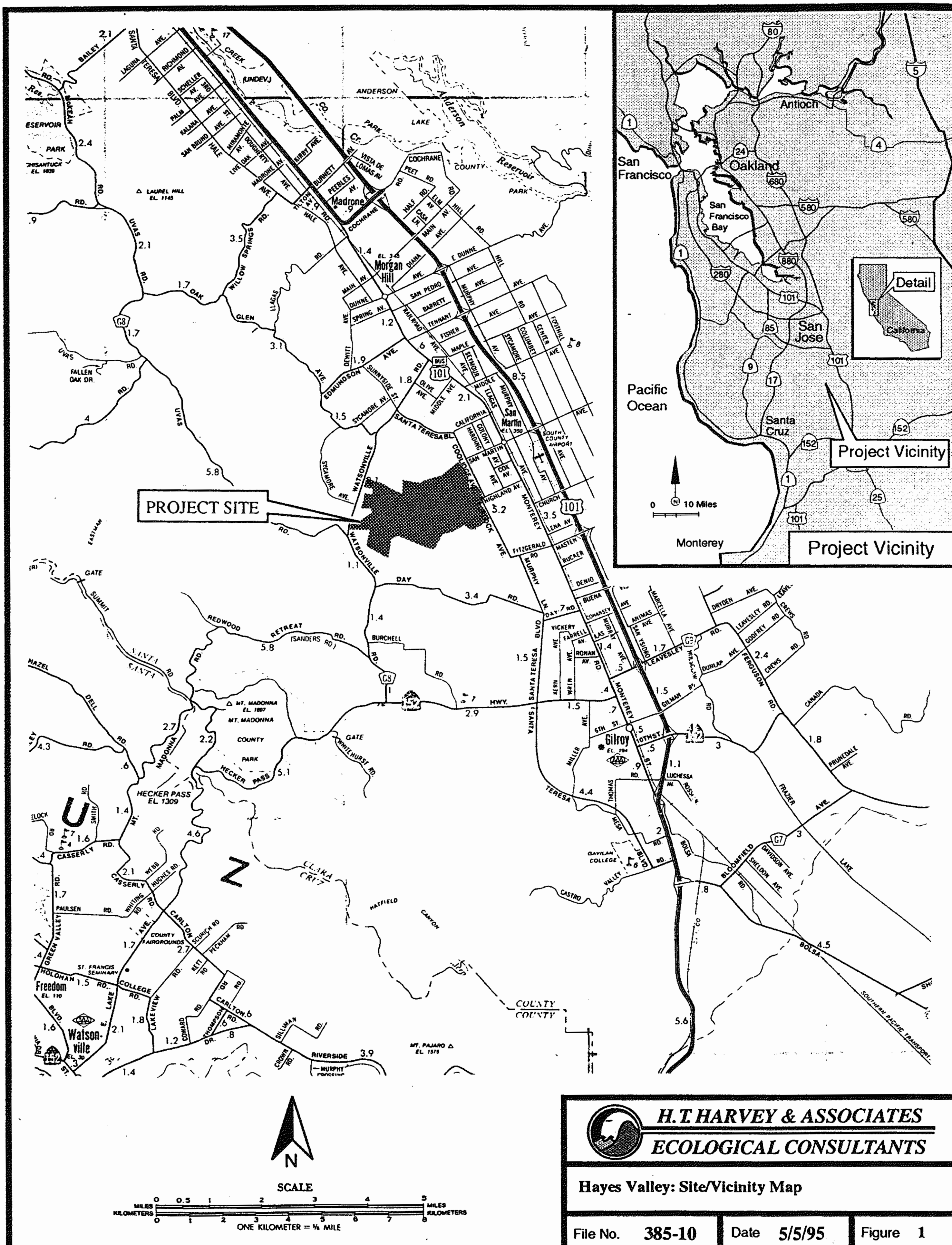
The Hayes Valley property is an approximately 1,676-acre parcel between Watsonville Road and Coolidge Avenue, southwest of the town of San Martin in southern Santa Clara County (Fig. 1). The northeastern and south-central boundaries are adjacent undeveloped open space. Other boundaries abut residential and agricultural areas.

The property is located on the eastern flank of the Santa Cruz Mountains. Hayes Valley, a broad area of almost level terrain and gently sloping alluvial fans, traverses the site from its northwestern to southeastern boundaries. The valley is surrounded by moderately steep to very steep slopes. Site elevations range from approximately 300 to 1100 feet NGVD (National Geodetic Vertical Datum).

Several soil types, including the Garretson, Gaviota, Inks, Keefer, Los Robles, Maxwell, Montara, and Vallecitos series occur on the project property. Both the Maxwell and Montara series are serpentine soils. The serpentine soils are restricted to the eastern and northern portion of the property, north of Hayes Valley. Inks and Vallecitos series soils, found in several locations in the western part of the property, may include small amounts of serpentine soil as well.

An intermittent drainage, which is a tributary of Llagas Creek, flows through the eastern two-thirds of Hayes Valley and continues eastward off the property. The creek is joined along its course by several smaller intermittent creek channels which drain the hillsides surrounding the valley. Several cattle ponds are located on the site.

The majority of the site is undeveloped, however, several residences, stables, and barns are located near the eastern border off of Highland Avenue. An orchard and agricultural field are also located at the southeastern border. Much of the site is currently used for cattle grazing. Numerous fences, dirt roads, and trails are located throughout the site.



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Hayes Valley: Site/Vicinity Map

File No. 385-10	Date 5/5/95	Figure 1

BIOTIC HABITATS

Reconnaissance-level field surveys were conducted in April and May, 1992, May and June, 1993, April 1994 and April 1995 to identify plant communities, review botanical and wildlife resources, and survey for biotic habitats which may be considered suitable for special-status plants and animals. Ten different habitats were identified within the study area. These include non-native grassland (non-serpentine substrate), non-native grassland/wildflower field (serpentine), Diablan sage scrub, valley oak woodland, valley oak/sycamore riparian woodland, aquatic, emergent vegetation, seasonal wetland, orchard/cropland and residential/developed (Fig. 2). Where appropriate, the communities have been named according to Holland's system of classification (1986). Habitats were mapped with the aid of a blue line aerial photo (scale 1"=400") and were ground-truthed in the field. The approximate sizes of these habitats in the study area is shown the Table 1. Lists of the vascular plant species observed and vertebrate species either expected to occur or observed on the project site during field surveys have been provided in Appendices A and B, respectively.

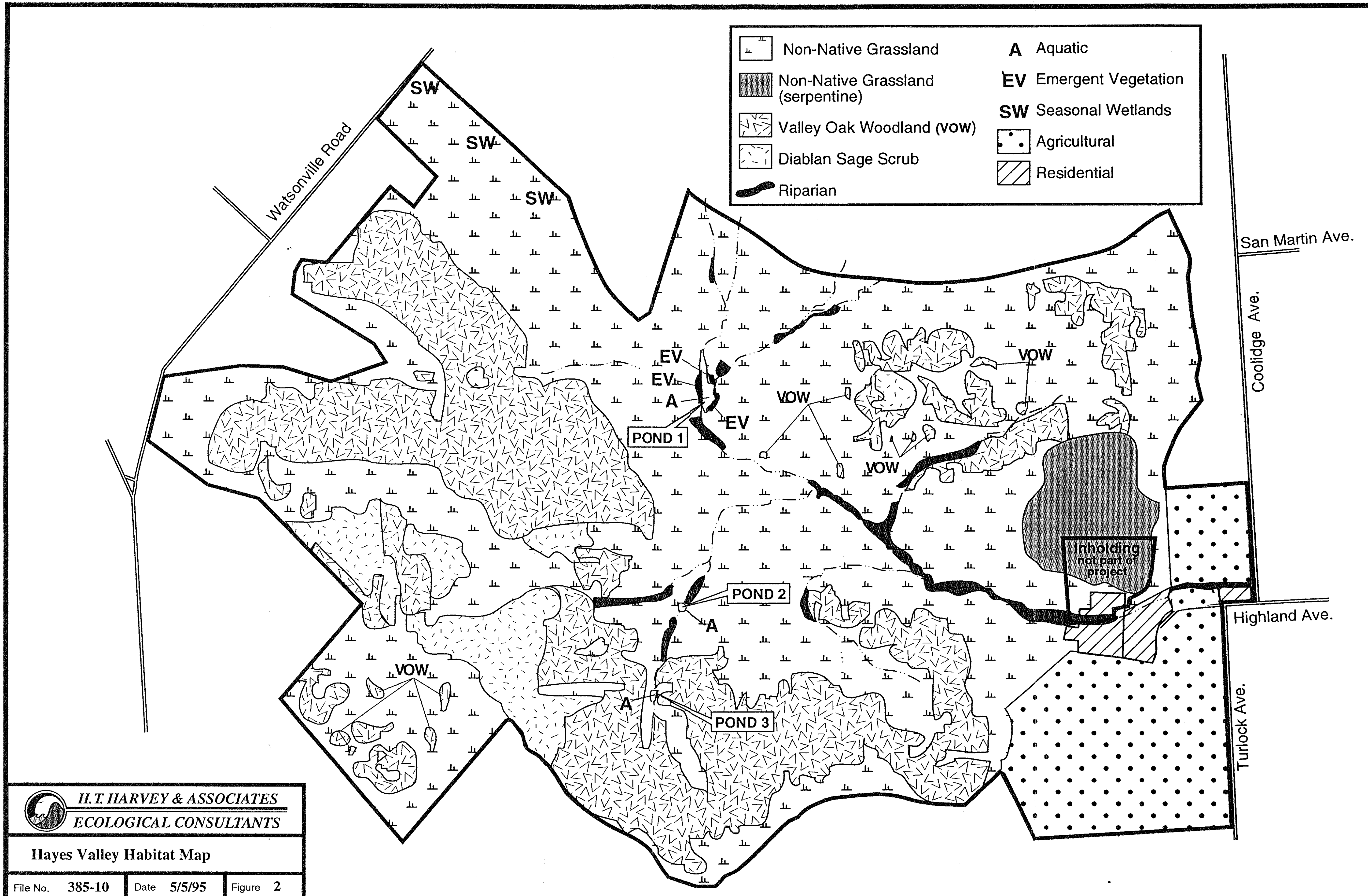
Table 1. Areal extent of the habitats found on the Hayes Valley Site, Santa Clara County, California.

Habitat Type	Acres	Percent of Total
Non-native Grassland (non-serpentine)	873.7	52.1
Non-native Grassland/Wildflower field (serpentine)	33.5	2.0
Valley Oak Woodland	480.0	29.0
Diablan Sage Scrub	82.0	4.9
Valley Oak/Sycamore Riparian Woodland	18.6	1.1
Aquatic	5.6*	0.3
Emergent Vegetation	0.7	0.0
Seasonal Wetlands	4.0*	0.2
Orchard/Cropland	164.0	9.8
Residential/Developed	13.9	0.8
TOTAL	1,676	100.1

* Acreage estimates partially based on LSA 1994

Non-native grassland (non-serpentine substrate)

Vegetation. Over fifty percent of the site (approximately 874 acres) consists of non-native grassland, which occupies the valleys and many of the south- and west-facing slopes of the site. Much of the grassland on site is used as cattle pasture. This community is dominated by annual non-native grasses, including wild oats (*Avena fatua*), Italian ryegrass (*Lolium multiflorum*), farmer's foxtail (*Hordeum murinum* ssp. *leporinum*), and Mediterranean barley (*Hordeum marinum* ssp. *gussoneanum*). Other common components include ripgut brome (*Bromus diandrus*), soft chess (*Bromus hordeaceus*), black mustard (*Brassica nigra*), American vetch (*Vicia americana*), Italian thistle (*Carduus pycnocephalus*), and red-stem filaree (*Erodium cicutarium*). Native species such as Ithuriel's spear (*Triteleia laxa*), California poppy (*Eschscholzia californica*), and the native perennial purple needlegrass bunchgrass (*Nassella pulchra*) are also scattered in mixed stands throughout the site. Several depressions and swales within the grassland support Mediterranean barley, a species indicative of higher moisture levels.



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Hayes Valley Habitat Map

File No. 385-10 | Date 5/5/95 | Figure 2

Wildlife. These non-native grasslands provide habitat for many species of wildlife. Reptiles may be conspicuous during warmer months of the year, especially along the rocky hillsides adjacent to the valley or under fallen trees, branches, or other debris found along the drainage running through the valley and in other areas of the site. Species expected to occur in non-native grasslands include the western fence lizard (*Sceloporus occidentalis*), western skink (*Eumeces skiltonianus*), gopher snake (*Pituophis melanoleucus*), and striped racer (*Masticophis lateralis*). Several rodent species use burrows for cover and nesting chambers. An abundant rodent throughout the low-lying portions of the site is the California ground squirrel (*Spermophilus beecheyi*). Botta's pocket gopher (*Thomomys bottae*), which creates extensive underground tunnels in its search for bulbs, roots, stems, and tubers (Ingles 1965), was common on the site. The burrow systems created by rodents may also be used by amphibians, such as the California tiger salamander (*Ambystoma californiense*) and western toad (*Bufo boreas*), both of which were observed on site. Burrowing Owls (*Speotyto cunicularia*), which have not been observed on the site since 1988, also use California ground squirrel burrows for nesting and cover.

Several species of birds use grassland habitats throughout the year. Savannah Sparrows (*Passerculus sandwichensis*) and Western Meadowlarks (*Sturnella neglecta*) build their nests directly on the ground in grasslands. A Western Meadowlark nest was found on the valley floor, and Meadowlarks were observed throughout the grasslands.

Seeds produced by annual and perennial grasses provide food for migrating and wintering songbirds, such as American Goldfinches (*Carduelis tristis*). Goldfinches pluck seeds from flowers and grass stalks. Small rodents, such as the western harvest mouse (*Reithrodontomys megalotis*), also use grass seeds and stalks as food sources. Networks of runways may be formed through the grasses as a result of California voles (*Microtus californicus*) clipping grasses and herbs at their bases (Gill 1977). Mammalian predators, such as the coyote (*Canis latrans*) and bobcat (*Lynx rufus*) hunt for mice, gophers, ground squirrels, and black-tailed hares (*Lepus californicus*) in these grasslands. Northern Harriers (*Circus cyaneus*) may hunt for small mammal prey over low hills and valleys on the site. Golden Eagles (*Aquila chrysaetos*) and Red-tailed Hawks (*Buteo jamaicensis*) commonly forage in the valley, especially where there is a high occurrence of ground squirrels. Forbs, such as clover (*Trifolium sp.*), miner's lettuce (*Montia perfoliata*), and phacelia (*Phacelia imbricata*) provide important forage for black-tailed deer (*Odocoileus hemionus columbianus*) during the spring and early summer.

Non-native grassland/wildflower field (serpentine substrate)

Vegetation. Non-native grassland occupies the majority of the serpentine hills in the northeastern portion of the project site. The grassland (serpentine substrate) is primarily dominated by wild oats, with soft chess and Italian ryegrass as sub-components. Purple needlegrass is also present, sometimes in small distinct clumps, or as a sub-dominant with other grasses. Native and non-native forbs including California poppy, field bindweed (*Convolvulus arvensis*), rose clover (*Trifolium hirtum*), western larkspur (*Delphinium hesperium*), owl's clover (*Castilleja densiflora*), white Mariposa tulip (*Calochortus venustus*), and blue dicks (*Dichelostemma capitatum*) are also scattered throughout the grasses.

Patches of wildflower field habitat occur within the matrix of non-native grassland in the easternmost serpentine area only. These patches occur where the soils are very thin and rocky. The wildflower fields are dominated by native annual forbs, with both native and non-native grasses existing as a minor sub-component. Typical species include goldfields (*Lasthenia californica*), most beautiful jewelflower (*Streptanthus albidus* ssp. *paramoenus*), purple owl's clover (*Castilleja exserta*), California plantain (*Plantago erecta*), Ithuriel's spear, Chile trefoil (*Lotus wrangelianus*), deerweed (*Lotus scoparius*), serpentine linanthus (*Linanthus ambiguus*), white Mariposa tulip (*Calochortus venustus*), soap plant (*Chlorogalum pomeridianum*), sticky calycadenia (*Calycadenia multi-glandulosa*), California poppy, one-sided bluegrass (*Poa secunda* ssp. *secunda*), wild oats, and soft chess.

Rocky serpentine outcrops are also scattered throughout the easternmost serpentine area. These outcrops support a sparse cover of mostly native species, including Santa Clara Valley dudleya (*Dudleya setchellii*). Uncommon jewelflower is often found on outcrop edges. Other common species of the outcrops include popcornflower

(*Plagiobothrys* sp.), California gilia (*Gilia achilleifolia*), buckwheat (*Eriogonum* sp.), and stunted wild oats, and soft chess.

Wildlife. Serpentine grasslands support vertebrate wildlife species similar to that of non-native grasslands (non-serpentine substrate). But the grasslands frequently support an invertebrate fauna that is specifically adapted to serpentine based soils. No special-status invertebrates, however, were observed on site by biologists from the Center for Conservation Biology at Stanford University (see their report for a detailed description of special-status invertebrates). Several avian species would be expected to occur in this habitat, including the Killdeer (*Charadrius vociferus*), Horned Lark (*Eremophila alpestris*), Lincoln's Sparrow (*Melospiza lincolnii*), and Spotted Sandpiper (*Actitis macularia*). Small mammals, such as the western harvest mouse, ornate shrew (*Sorex ornatus*), and California vole (*Microtus californicus*) would also be found in this habitat, especially in and at the edges of dense vegetation.

Valley Oak Woodland

Vegetation. Valley oak woodland is present mostly on the northeast- to northwest-facing slopes of the project site. The canopy cover ranges from open and savanna-like (mostly at the lower elevations) to almost closed (at the higher elevations). Valley oak (*Quercus lobata*) is the dominant tree of this woodland, occurring in almost pure stands in the lower elevations of the site. Also present are blue oak (*Quercus douglasii*), coast live oak (*Quercus agrifolia*), and California buckeye (*Aesculus californicus*). The understory is primarily herbaceous in many locations, and consists of several species of non-native grasses, including wild oats, farmer's foxtail, and bedstraw (*Galium* sp.). Poison oak is often the only understory shrub. Woodland openings and understories in the steep, southern portion of the site often include small patches of Diablan sage scrub.

Wildlife. Oak Woodland habitat is one of the most diverse and productive habitats for wildlife in central California. These woodlands function as escape cover, thermal cover, migration corridors, and nesting and foraging habitat for a diverse wildlife community. Rotting logs and loose rocks in damp shady areas provide important habitat to a variety of reptiles and amphibians. The arboreal salamander (*Aneides lugubris*), western skink, and southern alligator lizard (*Gerrhonotus multicarinatus*) are expected to occur in this habitat. Additionally, the common kingsnake (*Lampropeltis getulus*) uses rocks and downed logs for cover. This species forages on amphibians, reptiles, birds, and mammals in this habitat. Other snakes likely to use forested habitats of the site include the California whipsnake (*Masticophis lateralis*) and western rattlesnake (*Crotalus viridis*).

The Oak Woodland community provides habitat for a variety of avian species. The proximity of this habitat to the grassland communities in the valley increases their ecological importance. For example, birds such as the Red-tailed Hawk and American Kestrel forage in grasslands and often require adjacent woodlands to roost and nest. Several Red-tailed Hawks and American Kestrels have been observed on the site.

Oak acorns provide food for several species, including the Scrub Jay (*Aphelocoma coerulescens*) and Acorn Woodpecker (*Melanerpes formicivorus*). Insects that live beneath the tree bark or on foliage provide food for many bird species, including the Plain Titmouse (*Parus inornatus*), Bushtit (*Psaltriparus mimimus*), and Hutton's Vireo (*Vireo huttoni*). Yellow-rumped Warblers (*Dendroica coronata*) and Ruby-crowned Kinglets (*Regulus calendula*) are commonly seen in winter foraging for insects among oak branches. Several bird species depend on standing dead or partially dead trees (snags) for nesting, feeding, and shelter. These include American Kestrel, Western Bluebird (*Sialia mexicana*), Acorn Woodpecker, White-breasted Nuthatch (*Sitta carolinensis*), and Nuttall's Woodpecker (*Picoides nuttallii*). Northern Flickers (*Colaptes auratus*) are also commonly found in oak woodland habitat. A Lewis' Woodpecker (*Melanerpes lewis*), an uncommon species for the region, was observed nesting on the site in 1994.

An inactive Golden Eagle nest was detected on the north side of the valley floor in a coast live oak in 1989 (H. T. Harvey and Associates 1989), and appears to have been active during previous years (Fig. 3). An immature Golden Eagle was observed flying over the site in 1988. Up to five Golden Eagles have been observed simultaneously on site. In 1992 eagles did not nest on site, but used a nest site along the south side of Lion's Peak, approximately 0.25 miles southeast of the property line (Fig. 3). The pair fledged two young in 1992 (H. T. Harvey and Associates 1992). The nest was again active in 1993, and the pair successfully fledged one young in 1993. The nest site was not active in April, 1994, and the nest had partially fallen. A single Golden Eagle exhibiting territorial behavior was observed in the same drainage, which indicates that a pair was probably nesting in the vicinity.

Oak woodland habitats support a diverse assemblage of mammals, including black-tailed hare, California ground squirrel, western gray squirrel (*Sciurus griseus*), deer mouse, and Botta's pocket gopher. Typically, a relatively high diversity of predators forage in these woodlands due to an abundance of small birds and mammals. These predators include the Red-tailed Hawk, Cooper's Hawk (*Accipiter cooperii*), Sharp-shinned Hawk (*Accipiter striatus*), coyote, red fox (*Vulpes vulpes*), gray fox (*Urocyon cinereoargenteus*), raccoon (*Procyon lotor*), and striped skunk (*Mephitis mephitis*).

This habitat is preferred by black-tailed deer, because it generally provides a diversity of food plants and cover for reproduction. Forbs are important forage for deer during the spring and early summer. Beginning with the fall rains, grasses become an important component of the deer diet. Additionally, the mast, or acorn drop, in fall is considered an important dietary component for both deer and wild pig (*Sus scrofa*) in California. This oak woodland provides the puma (*Felis concolor*), an ambush predator, substantial cover for hunting its primary prey, the black-tailed deer and to a lesser extent wild pigs (*Sus scrofa*).

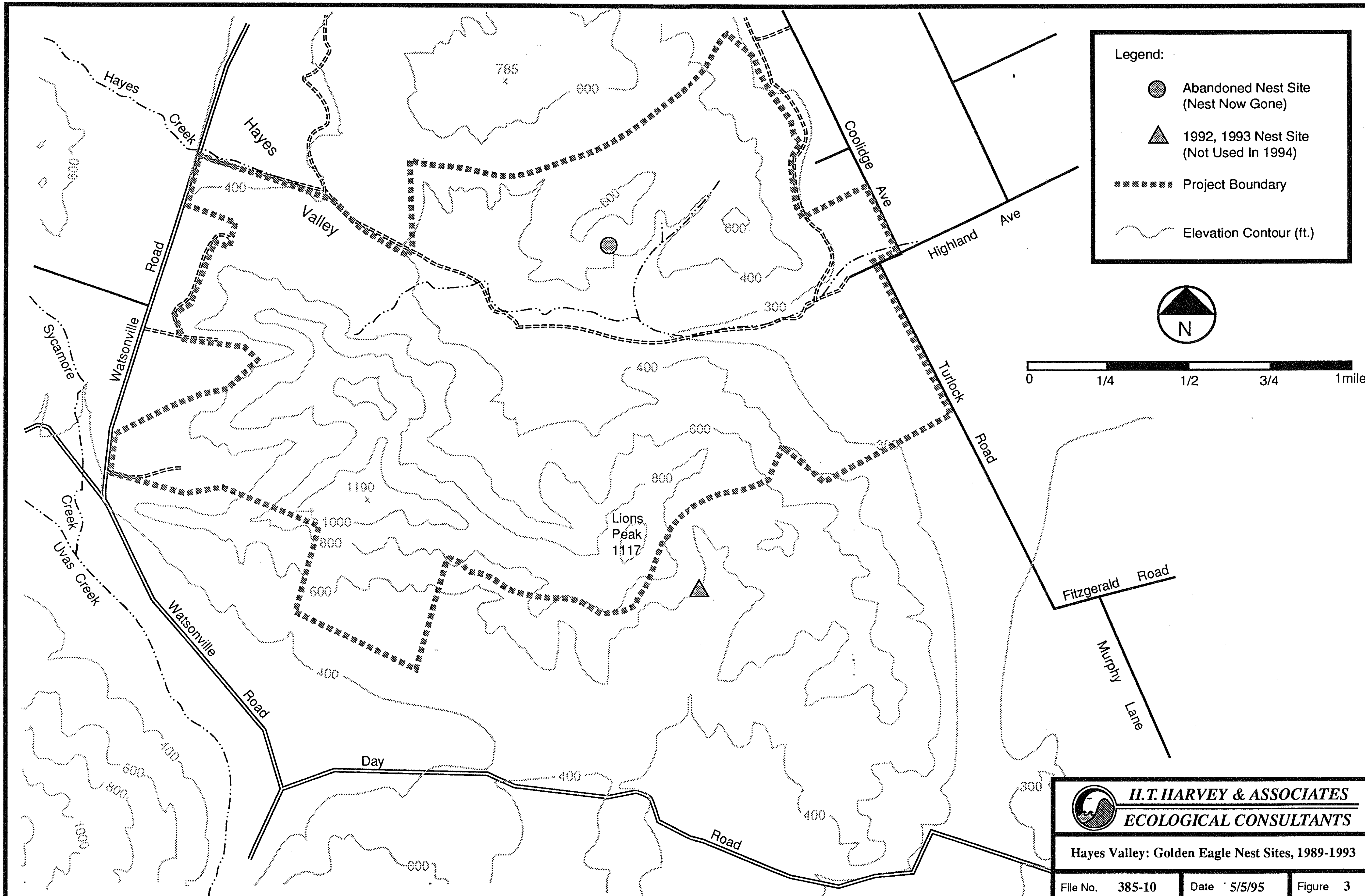
Diablan Sage Scrub

Vegetation. Diablan Sage Scrub occurs primarily in the southern region of the site. A few small patches, however, occur in more northern locations. The relatively large stands on the steep southern hillsides intergrade with and often include patches of oak woodland. The Diablan sage scrub of the site is characterized by a dense cover California sage interspersed with sticky monkey flower. Deerweed and purple needle grass are often present on the community borders and in the occasional canopy openings. The scrub community of the higher elevations in the southern portion of the site may also include manzanita (*Arctostaphylos* sp.) and coyote brush (*Baccharis pilularis*).

Wildlife. Wildlife species commonly associated with this habitat include the Rufous-sided Towhee (*Pipilo erythrophthalmus*), California Thrasher (*Toxostoma redivivum*), Fox Sparrow (*Passerella iliaca*), and Wrentit (*Chamaea fasciata*). Species which were observed foraging on site in this habitat included Western Meadowlarks and Savannah Sparrows (*Passerculus sandwichensis*). A Sage Thrasher (*Oreoscoptes montanus*), a species normally found in the Great Basin and desert areas of California, was observed at the site in 1994 (A. Launer pers. comm.) The black-tailed hare, which would normally be abundant in scrub habitat, was not observed during surveys. A California horned lizard (*Phrynosoma coronatum frontale*) was observed at the edge of sage scrub habitat bordering oak woodland on site during a past survey. Other reptiles commonly found in this habitat on site include the western fence lizard, southern alligator lizard, and western rattlesnake.

Valley Oak/Sycamore Riparian Woodland

Vegetation. Valley oak/sycamore riparian woodland occurs intermittently along several of the drainages of the property. The riparian woodland consists primarily of large, relatively widely-spaced trees. Little or no woody understory vegetation is present, and almost no regeneration of trees has occurred. The relatively simple and open structure of the riparian habitat has resulted in a reduction of its value to wildlife. This vegetation type consists of plants which are either found only in association with water, or are more abundant along water courses than in the immediately adjacent vegetation. The valley oak/sycamore riparian woodland of the site consists almost exclusively of very large, mature relatively widely spaced valley oak and California sycamore (*Platanus racemosa*) trees located along the banks of the streams. Red willow (*Salix laevigata*) is occasionally present. Riparian woodland is most abundant along the largest creek of the site, which flows through the eastern two-thirds of Hayes Valley. The woodland understory (and the creek banks outside the tree canopies) is primarily occupied by species



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Hayes Valley: Golden Eagle Nest Sites, 1989-1993

File No. 385-10 | Date 5/5/95 | Figure 3

commonly found in the non-native annual grassland, and generally lacks both understory shrubs and seedling sapling trees. Typical herbaceous species include soft chess, Mediterranean barley, farmer's foxtail, Italian thistle, ripgut grass, and red-stem filaree. California rose (*Rosa califor nica*), a native shrub, occurs very occasionally in the understory. Wetter areas directly adjacent to the water's edge support hydrophytic species, which are found only in association with water. Watercress (*Rorripa nasturtium-aquaticum*), sedges (*Carex* sp.), curly dock (*Rumex crispus*), toad rush (*Juncus bufonius*), hyssop loosestrife (*Lythrum hyssopifolium*), common monkeyflower (*Mimulus guttatus*), and spike-rush (*Eleocharis* sp.) grow here.

The strip of riparian woodland which runs through the agricultural field in the eastern portion of the property is different in character than other riparian woodland of the site. The tree canopy is denser, often closed. Small to moderate-sized valley oaks are dominant; California black walnut (*Juglans hindsii* var. *californica*) and cherry (*Prunus* sp.) are also present.

Scattered clusters and individual riparian trees are generally infrequent, but present, along the tributary creeks which drain the hills surrounding Hayes Valley. Species composition at the water's edge and adjacent to it is similar to that described for the larger valley creek, although the extent of such vegetation is more limited.

The valley oak/sycamore riparian woodland of the site is similar to the sycamore alluvial woodland community described by Holland (1986). Sycamore alluvial woodland is considered to be a rare community by the CDFG.

Wildlife. Riparian woodlands typically constitute important movement corridors for both resident and migratory wildlife, connecting a variety of habitats throughout the region. They are used by some raptors for nesting and roosting, even where other habitats are used for foraging. Riparian areas of greatest value to wildlife are floristically and structurally diverse. The wildlife value of the riparian habitat of Hayes Valley have been modified by years of livestock grazing. Trees are generally widely spaced, creating an open canopy. A well-developed multilayered shrub understory is generally absent. Despite the degradation caused by cattle on the slopes and lack of forbs and shrubs on the banks, this habitat is important to the native wildlife of Hayes Valley. Nonetheless, the value of these woodlands is greatly reduced when compared with a less disturbed riparian woodland.

A variety of reptiles and amphibians may be expected to occur in riparian habitats of the site. Leaf litter, downed tree branches, and fallen logs provide cover for the California newt (*Taricha torosa*), western toad, and Pacific treefrog (*Pseudacris regilla*). Several lizards also occur here, including the western fence lizard, western skink, and southern alligator lizard. Snakes common to riparian habitats include the western rattlesnake, racer, and common kingsnake. Western pond turtles occurring in the ponds on site may also nest along the main creek drainage.

The oaks, sycamores, and other mature trees may attract a number of avian species to the riparian habitat. Acorn Woodpecker, Nuttall's Woodpecker, and Northern Flicker excavate nest holes in dead tree branches. Nest holes abandoned by woodpeckers are used by Western Screech Owls (*Otus kennicottii*), Ash-throated Flycatchers (*Myiarchus cinerascens*), European Starlings (*Sturnus vulgaris*), and other cavity-nesting species. Small songbirds, such as Bushtits, Warbling Vireos (*Vireo gilvus*), and Wilson's Warblers (*Wilsonia pusilla*) may build their nests within the dense understory of willows. Other species, such as the Scrub Jay, Northern Oriole (*Icterus galbula*), and Bewick's Wren (*Thryomanes bewickii*) are also commonly found in riparian situations. Larger raptors, such as the White-tailed Kite (*Elanus caeruleus*), Red-shouldered Hawk (*Buteo lineatus*) and American Kestrals (*Falco sparverius*) which were both observed on site, prefer to situate their nests in the higher canopy of cottonwoods and buckeyes. A Downy Woodpecker (*Picoides pubescens*) was also observed foraging amongst branches and tree trunks for insects.

A variety of mammals may occur in riparian woodlands. Small mammals, such as the ornate shrew (*Sorex ornatus*), California vole, and Audubon's cottontail (*Sylvilagus audubonii*) may find refuge in tall grass or brushy thickets along stream banks. Predators, such as coyote and long-tailed weasel (*Mustela frenata*) are attracted to wooded riparian habitats by an abundance of prey. Black-tailed deer and, occasionally, pumas use these habitats on site.

Aquatic

Vegetation. The aquatic habitat of the site includes seven stock ponds and the seasonal flow in the numerous intermittent creeks of the site. Approximately 5.6 acres of aquatic habitat are present on site; the ponds occupy approximately 1.3 of these acres (LSA 1994). The largest pond (pond 1) is located within Hayes Valley (Fig. 2). Two smaller ponds are located adjacent to a tributary of the creek which runs through Hayes Valley. Several additional ponds are present, but not indicated on Fig. 2 due to their small size.

Wildlife. Amphibian and reptile species that have been observed in or near the stock ponds on site include the western pond turtle and California tiger salamander (*Ambystoma californiense*) (H. T. Harvey and Associates 1992). Many species of birds, especially ducks, may use the stock ponds for feeding, bathing, and roosting. Bird species commonly found at the edges of ponds include Great Blue Heron (*Ardea herodias*), Great Egret (*Casmerodius albus*), and Green Heron (*Butorides virescens*). Some species observed on the open water include the Mallard (*Anas platyrhynchos*), Wood Duck (*Aix sponsa*), and American Coot (*Fulica americana*).

Emergent Vegetation

Vegetation. The margins of aquatic areas frequently support a variety of vascular plants, some of which are hydrophytes adapted to aquatic conditions, and others which may tolerate seasonal inundation but flourish best when inundation or soil saturation are no longer present. The emergent vegetation on site consists almost exclusively of spike-rush (*Eleocharis macrostachya*). Pond 1 is bordered by a dense fringe of this species varying in width from approximately 1 foot to 200 feet. Small areas of pond 2 are bordered by a thin fringe of spike-rush, and several small clumps (approximately 2 ft. by 4 ft.) are located within the pond. The stand of emergent vegetation on pond 2 is not large enough to mapped and is, therefore, not indicated on Figure 2. Two seasonal tributaries which feed pond 1 also support stands of emergent vegetation within their banks (these do not appear in Fig. 2). Several other wetland species, including iris-leaved rush (*Juncus xiphiodes*) and watercress, grow within the tributaries.

Wildlife. Several wildlife species may inhabit emergent vegetation, and use the rushes for cover. Pacific treefrogs (*Pseudacris regilla*) were observed in pond 1 during site visits (Fig. 2). The dense vegetation would provide cover and adequate moisture for the common garter snake (*Thamnophis sirtalis*), which preys on tree frogs and other small vertebrates. Red-winged Blackbirds (*Agelaius phoeniceus*) would be attracted to the dense stands of rushes during the breeding season. Black Phoebes (*Sayornis nigricans*) and Song Sparrows (*Melospiza melodia*) may forage in and around the wet areas for insects. The seasonal marsh vegetation would provide nesting habitat for the Common Snipe (*Gallinago gallinago*) and Northern Harrier.

Seasonal Wetlands

Vegetation. Several relatively small seasonal wetlands occur within the matrix of the non-native grassland in the valley, primarily towards the northwestern end of the property (near Watsonville Road). These seasonally wet areas occurs in slight depressions where moisture from seasonal rainfall collects. These areas appear to pond as a result of the channelization of Hayes Creek in the area, the mounding of the fence line adjacent to Hayes Creek, and the annual regrading of the access road through the area. All these factors apparently interrupt the historic drainage of the site, and create man-made spring pools. The condition of these seasonal wetlands varies from fairly undisturbed to degraded; a dirt road passes through several of the wetlands.

The seasonal wetlands were dominated by Mediterranean barley in 1994. However, during the spring of 1992 and 1993, portions of these areas (approximately 0.2 to 0.4 acres) were dominated by several species typical of vernal pool habitats, including maroon-spotted downingia (*Downingia concolor*) and hyssop loosestrife. Other common species, some of which were abundant in one or more of the pools, included toad rush (*Juncus bufonius*), flowering quillwort (*Lilaea scilloides*), smooth lasthenia (*Lasthenia glaberimma*), snow-white meadowfoam (*Limnanthes douglasii* ssp. *nivea*), bracted popcornflower (*Plagiobothrys bracteatus*) and Mediterranean barley. Checking with local records and other botanists, this vernal pool-like flora appears to be very uncommon in Santa Clara County.

Wildlife. Several species of invertebrates only occur in alkaline freshwater vernal pools, seasonal wetlands, or other ponded areas including the longhorn fairy shrimp (*Branchinecta longiantenna*), vernal pool fairy shrimp (*Branchinecta lynchi*), and California linderiella (*Linderiella occidentalis*). Although fairy shrimp have been observed in one of the ponds on site, no samples were taken and hence, species identification is not possible at this time (A. Launer pers. comm.). The California tiger salamander may move into temporary ponded areas during and after rains to breed, but these areas pond too shallowly and dry too quickly for successful breeding.

Orchard/Cropland

Vegetation. A walnut orchard and fallow agricultural field are located near the southeastern border. An understory of non-native grasses is present in the orchard. The fallow field consists primarily of wild oats, Italian ryegrass and common barley (*Hordeum vulgare*).

Wildlife. Birds typically found in this habitat and observed in the abandoned plum orchard on site include Northern Mockingbird (*Mimus polyglottos*), Northern Oriole (*Icterus galbula*), Mourning Dove (*Zenaida macroura*), and House Finch (*Carpodacus mexicanus*). Other species observed on site or in the vicinity included Yellow-billed Magpie (*Pica nuttalli*), American Crow (*Corvus brachyrhynchos*), and California Quail (*Callipepla californica*). A large Monterey pine tree (*Pinus radiata*) at the southeast corner of the orchard would provide a potential roost for Red-tailed Hawk or other raptor. Some wood piles in the orchard would also provide cover for western fence lizards and southern alligator lizards.

Residential/developed

Vegetation. Several residences, ranch buildings and associated structures are located in the northeastern portion of the property. Landscape vegetation and numerous large non-native trees and large valley oaks are present in this area.

Wildlife. Residential and developed habitats may support a variety of wildlife, depending on the amount of shrubby vegetation, height and density of the tree canopy, and the presence of debris, such as wood piles, weedy lots, etc. There are several bird species typical of this type of habitat. A common invasive species is the European Starling, which may nest in the palm trees on site. Starlings may also use dead snags for nesting or roosting. House Sparrows (*Passer domesticus*) typically nest under eaves or in shrubs near human habitation. Other bird species commonly found near residences with gardens include the House Finch, Northern Mockingbird, and California Towhee (*Pipilo crissalis*).

SPECIAL-STATUS PLANT AND WILDLIFE SPECIES

Information concerning threatened, endangered, or other special-status species that may occur in the area was collected from several sources. Special-status plants, mammals, birds, and fairy shrimp were reviewed by H. T. Harvey and Associates. All other invertebrates were reviewed by Dennis Murphy and Alan Launer of Stanford University, and are addressed elsewhere in the Hayes Valley EIR. The sources consulted included the California Department of Fish and Game's Natural Diversity Data Base (CNDDB 1994), California Wildlife Habitat Relationships species notes (CDFG 1988, 1990a, 1990b), Santa Clara County Sensitive Natural Resource Maps (H. T. Harvey and Associates 1980), and miscellaneous information available through the U.S. Fish and Wildlife Service (USFWS), California Department of Fish and Game (CDFG), and technical publications. The California Native Plant Society's *Inventory of Rare and Endangered Vascular Plants of California* (Skinner and Pavlik

1994), *The Flora of the Santa Cruz Mountains of California* (Thomas 1961) and *The Jepson Manual* (Hickman 1993) supplied information regarding the distribution and habitats of vascular plants in the vicinity.

A search of published accounts of these species was conducted for the Mt. Madonna Quad (USGS Topographical Quadrangle Map) in which the majority of the project site is located, and the eight surrounding quads including Gilroy, Mt. Sizer, Loma Prieta, Santa Teresa Hills, Morgan Hill, Watsonville West, and Watsonville East using the California Natural Diversity Data Base Rarefind (1994). All species listed as occurring in Santa Clara County and occurring on CNPS Lists 1A, 1B, or 2 were reviewed. In addition, CNPS list 4 species known to occur on the project site are also included.

Special-Status Species Regulations Overview.

Several plant and animal species known to occur in the vicinity of the project site have been given special status under federal or state endangered species legislation or otherwise have been designated as sensitive by state resource agencies or professional organizations whose lists are recognized by responding agencies when reviewing environmental documents. Such species are referred to collectively as "species of special-status".

Federally-listed threatened and endangered species and their habitats are protected under provisions of the federal Endangered Species Act (FESA). "Take" under FESA includes activities such as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any of the specifically enumerated conduct." Harm specifically includes "significant habitat modification or degradation." Activities which may result in "take" of individuals are regulated by the USFWS. Candidate species on Lists 1 and 2 also receive special attention from federal agencies during environmental review. Taxa for which the USFWS has sufficient biological information to support a proposal to list as Endangered or Threatened are placed in Category 1. Taxa, the listing of which may be warranted according to existing information, but for which substantial biological information to support a proposed rule is lacking, are placed in Category 2. Some candidate species have been petitioned for federal listing. These species are often treated by resource agencies as if they were actually listed during the environmental review process.

State-listed threatened and endangered species and are protected under provisions of California's Endangered Species Act (CESA). Activities which may result in "take" of individuals (e.g., "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill") are regulated by the California Department of Fish and Game (CDFG). Habitat degradation or modification is not included in the definition of "take" under CESA. Nonetheless, CDFG has interpreted "take" to include the destruction of nesting and foraging habitat necessary to maintain a viable breeding population of the relevant state threatened or endangered species.

The CDFG has also produced three lists of "species of special concern" which serve as "watch lists". Species on these lists either are of limited distribution or the extent of their habitats has been reduced substantially, such that threat to their populations may be imminent. Thus, their populations should be monitored. They may receive special attention during environmental review, but do not have statutory protection.

Vascular plants listed as rare or endangered by the California Native Plant Society (California Native Plant Society 1988, 1993), but which have no designated status under state endangered species legislation, are defined as follows:

·List 1B. Plants rare, threatened, or endangered in California and elsewhere. ·List 2. Plants rare, threatened, or endangered in California, but more numerous elsewhere. ·List 3. Plants about which we need more information - A review list. ·List 4. Plants of limited distribution - A watch list.

Table 2. Special-status plant and animal species, their status, and potential occurrence on the Hayes Valley Project Site, Santa Clara County, California.

SPECIES COMMON NAME	SCIENTIFIC NAME	STATUS*	POTENTIAL FOR OCCURRENCE ON SITE
PLANTS			
State or Federally Endangered or Threatened or Proposed Endangered or Threatened			
Tiburon Indian Paintbrush	*Castilleja affinus ssp. neglecta*	FE, ST, 1B	May be present on serpentine hills north of project footprint.
Coyote Ceanothus	*Ceanothus ferrisae*	FE, 1B	Not observed during rare plant surveys; presumed absent.
Santa Clara Valley Dudleya	*Dudleya setchellii*	FE, 1B	Present on serpentine hills north of project footprint.
Metcalf Canyon Jewelflower	*Streptanthus albidus ssp. albidus*	FE, 1B	Not observed during rare plant surveys; presumed absent.
State Protected, Federal Candidate Species, or CNPS List 4			
Showy Indian Clover	*Trifolium amoenum*	FC2*, 1B	Not observed during rare plant surveys; presumed absent.
Contra Costa Goldfields	*Lasthenia conjugens*	FC1, 1B	Not observed during rare plant surveys; presumed absent.
Most Beautiful Jewelflower	*Streptanthus albidus ssp. peramoenu*	FC1, 1B	Present on serpentine hills north of project footprint.
Santa Clara Red Ribbons	*Clarkia concinna ssp. automixa*	FC2, 1B	No appropriate habitat within project footprint; presumed absent.
Mount Hamilton Thistle	*Cirsium fontinale var. campylon*	FC2, 1B	Not observed during rare plant surveys; presumed absent.
Fragrant Fritillary	*Fritillaria liliacea*	FC2, 1B	May be present on serpentine hills north of project footprint.
Big Scale Balsamroot	*Balsamorhiza m. var. macrolepis*	1B	No appropriate habitat within project footprint; presumed absent.
Hall's Bush Mallow	*Malacothamnus hallii*	1B	Not observed during rare plant surveys; presumed absent.
Serpentine Linanthus	*Linanthus ambiguus*	CNPS 4	Present on serpentine hills north of project footprint.
ANIMALS			
State or Federally Endangered or Threatened Species, or Proposed Endangered or Threatened.			
Longhorn Fairy Shrimp**	*Branchinecta longiantenna*	FE	Site is outside of known range; presumed absent.
Vernal Pool Fairy Shrimp**	*Branchinecta lynchi*	FT	Site is outside of known range; presumed absent.
California Linderiella**	*Linderiella occidentalis*	RL	Potential habitat on site; records exist from vicinity of site.
American Peregrine Falcon	*Falco peregrinus anatum*	FE, SE, ST	Rare to occasional visitor.
Willow Flycatcher	*Empidonax traillii*	SE	Rare to occasional transient.
San Joaquin Kit Fox	*Vulpes macrotis mutica*	FE, ST	None found during 1988 surveys; site its current outside range.
California Tiger Salamander	*Ambystoma californiense*	FPE, S	Suitable habitat present; observed on site during surveys.
California Red-legged Frog	*Rana aurora draytoni*	FPE, SP, S	Suitable habitat on site; none observed during surveys; potentially present.
Western Pond Turtle	*Clemmys marmorata*	FC2, S	Suitable habitat present; observed on site.

Table 2. Continued.

SPECIES: COMMON NAME	SCIENTIFIC NAME	STATUS*	POTENTIAL FOR OCCURRENCE ON SITE
California Species of Special Concern, State Protected, or Federal Candidate Species			
Western Spadefoot	*Scaphiopus hammondii*	FC2, S	No known records from Santa Clara County; presumed absent.
California Horned Lizard	*Phrynosoma coronatum frontale*	S	Suitable habitat; observed on site.
White-tailed Kite	*Elanus caeruleus*	CP	Suitable breeding and foraging habitat on site.
Northern Harrier	*Circus cyaneus*	S	Transient and winter visitor.
Sharp-shinned Hawk	*Accipiter striatus*	S	Marginal breeding habitat on site; potential forager.
Cooper's Hawk	*Accipiter cooperii*	S	Suitable breeding and foraging habitat on site.
Ferruginous Hawk	*Buteo regalis*	FC2	Potential winter visitor.
Golden Eagle	*Aquila chrysaetos*	CP, S	Forager on site; historical breeder.
Merlin	*Falco columbarius*	S	Potential winter visitor on site.
Prairie Falcon	*Falco mexicanus*	S	Transient and winter visitor.
Long-billed Curlew	*Numenius americanus*	FC2, S	Potential transient.
Burrowing Owl	*Speotyto cunicularia*	S	Suitable breeding habitat on site; historical records from site.
California Horned Lark	*Eremophila alpestris actia*	FC2	Suitable breeding habitat on site.
Loggerhead Shrike	*Lanius ludovicianus*	FC2	Suitable breeding habitat on site.
Yellow Warbler	*Dendroica petechia*	S	Potential migrant and transient; possible breeder on site.
Tricolored Blackbird	*Agelaius tricolor*	FC2,S	Suitable breeding habitat on site; potential breeder.
Townsend's Big-eared Bat	*Plecotus townsendii*	FC2, S	Potential forager; no suitable roosting habitat on site.
Pallid Bat	*Antrozous pallidus*	S	Potential forager; no suitable roosting habitat on site.
California Mastiff Bat	*Eumops perotis californicus*	FC2,S	Potential forager; no suitable roosting habitat on site.
Ringtail	*Bassariscus astutus*	CP	Suitable habitat on site; likely present.
American Badger	*Taxidea taxus*	S	Suitable habitat present; potential breeder on site.

* = Federal, state, and California Native Plant Society listing designations.
1B = California Native Plant Society's (CNPS) list 1B; plants rare, threatened, or endangered in California, and elsewhere.
CNPS 4 = CNPS list 4; plants of limited distribution; a watch list.
FE = Designated as an endangered species by the federal government under the authority of the federal Endangered Species Act.
FT = Designated as a threatened species by the federal government under the authority of the federal Endangered Species Act.
FPE = Currently proposed for endangered status by the federal government.
FC1 = Designated as a candidate species by the federal government. Occurrence on list 1 indicates that U. S. Fish and Wildlife Service has sufficient biological information to support a proposal to list the species as Endangered or Threatened.

Table 2. Continued.

FC2 = Designated as a candidate species by the federal government. Occurrence on list 2 indicates that U.S. Fish and Wildlife Service has potential information for upgrading listing to endangered or threatened, but conculsive data on the biological vulnerability and threat are not currently available to support proposed listing.
FC2*= Threat and/or distribution data are insufficient to support federal listing, but the organism is presemed extinct.
SE = Designated as an endangered species by the California Fish and Game Commission under the authority of the state Endangered Species Act.
ST = Designated as a threatened species by the California Fish and Game Commission under the authority of the state Endangered Species Act.
S = Species of special concern, includes species whose breeding populations in the state have declined severely or are otherwise so low that extirpation is a real possibility. There are no special legal statutes governing the protection of this group.
CP = Fully protected species in the state of California.
RL = listing determined to be unwarranted by the USFWS; no longer a candidate species.
**Other invertebrate species covered in separate report by the Center for Conservation Biology, Stanford University.

Special-Status Plant Species

The special-status plant species that occur in the vicinity in habitats similar to those found on the project site are described below. The legal status and likelihood of occurrence of these species on-site are given in Table 2. Species that occur in Santa Clara County, but do not occur in habitats or microhabitats present on the site were not included or discussed below.

Intensive field surveys were conducted between 1990-1992 for special-status plants on site. Surveys were also conducted on 17, 23, 24, 28 April, 1, 9, May, and 24 June, 1992. Surveys were conducted within the project area to be affected by development, and the hilly region situated to the north of the Valley floor (this region will subsequently be referred to as the "study area"). The survey method involved hiking the survey areas in a zig-zag pattern. These surveys were conducted during the appropriate time period for identification of most of the relevant special-status species, however, Tiburon paintbrush (*Castilleja affinis* ssp. *neglecta)* was not specifically searched for, as information regarding its potential for occurrence in Santa Clara County was not known prior to the publication of the CNPS *Inventory of Rare and Endangered Vascular Plants of California* (1994).

State or Federal Endangered or Threatended Species, or Proposed for State or Federal Status.

Tiburon Indian paintbrush (*Castilleja affinis* ssp. *neglecta*) Federal listing status: Endangered; State listing status: Threatened; CNPS List: 1B. This perennial herb grows on open serpentine slopes and serpentine grasslands. This species, which has been reported from only six locations, was previously known only from north of San Francisco Bay. Recently, however, it was reported from a site in the Morgan Hill quadrangle, in the Metcalf Canyon vicinity. The blooming period ranges from April to June. Specific surveys for this species have not been conducted. The serpentine habitat in the northeastern portion of the project site may provide appropriate habitat for this species. Tiburon paintbrush if present would only occur in the serpentine grassland on site.

Coyote Valley Ceanothus (*Ceanothus ferrisae*). Federal listing status: Endangered; State listing status: None; CNPS List: 1B. This shrubby species occurs on serpentine soils in chaparral and valley and foothill grassland communities between 400 and 1000 feet NGVD. It has been found in the western foothills of the Mount Hamilton Range near Anderson Reservoir. No individuals of any ceanothus species were observed during site surveys (i.e., in accordance with CDFG rare plant protocol) in 1990, 1991, or 1992. Therefore, Coyote Valley ceanothus is presumed to be absent from the study area.

Santa Clara Valley Dudleya (*Dudleya setchellii*). Federal listing status: Endangered; State listing status: None; CNPS List: 1B. This small, perennial, succulent plant grows primarily in serpentine rock crevices and in serpentine-derived soils in grassland communities. This species is narrowly restricted to the southern foothills of the Mount Hamilton Range and the eastern foothills of the Santa Cruz Mountains bordering the Santa Clara Valley. The typical blossoming period is from May to June. Approximately 100 to 220 Santa Clara Valley dudleya occur on the south-, east-, and west-facing slopes of the serpentine hills in the northeastern section of the property (Fig. 4).

Metcalf Canyon Jewelflower (*Streptanthus albidus* ssp. *albidus*). Federal listing status: Endangered; State listing status: None; CNPS List 1B. This plant is found on road-cuts, on rocky outcrops of serpentine, and on steep slopes of relatively thin, serpentine-derived soils. Its range is limited to the Santa Clara Valley region and it generally occurs east of Coyote Creek. The blooming period of this species ranges from April to early June. Metcalf Canyon jewelflower was not found during special-status species surveys and is, therefore, presumed to be absent from the study area.

State Protected, Federal Candidate Species, or CNPS List 4

Showy Indian Clover (*Trifolium amoenum*). Federal listing status: Candidate 2; State listing status: None; CNPS List: 1B. The habitat of this annual herb includes grasslands both on and off of serpentine substrates. Historically, this species was reported from several Bay Area counties, but is now known to occur at only one site in Sonoma County. The blooming period ranges from April to June. No showy Indian clover was found during special-status species surveys. This species is, therefore, presumed to be absent from the study area.

Contra Costa Goldfields (*Lasthenia conjugens*). Federal listing status: Candidate 1; State listing status: None; CNPS List: 1B. Contra Costa goldfields occurs on dry, sunny flats in valley grassland communities and along the drying borders of vernal pools up to 700 feet in elevation. This annual herb typically flowers from April to May. This species was known historically from several Bay Area counties, but is now know to exist only in Solano and Napa counties. The closest known historical occurrence occurred in the San Jose East quadrangle, several miles northwest of the project site. No Contra Costa goldfields were found during site surveys (i.e., in accordance with CDFG rare plant protocal). This species is, therefore, presumed to be absent from the study area.

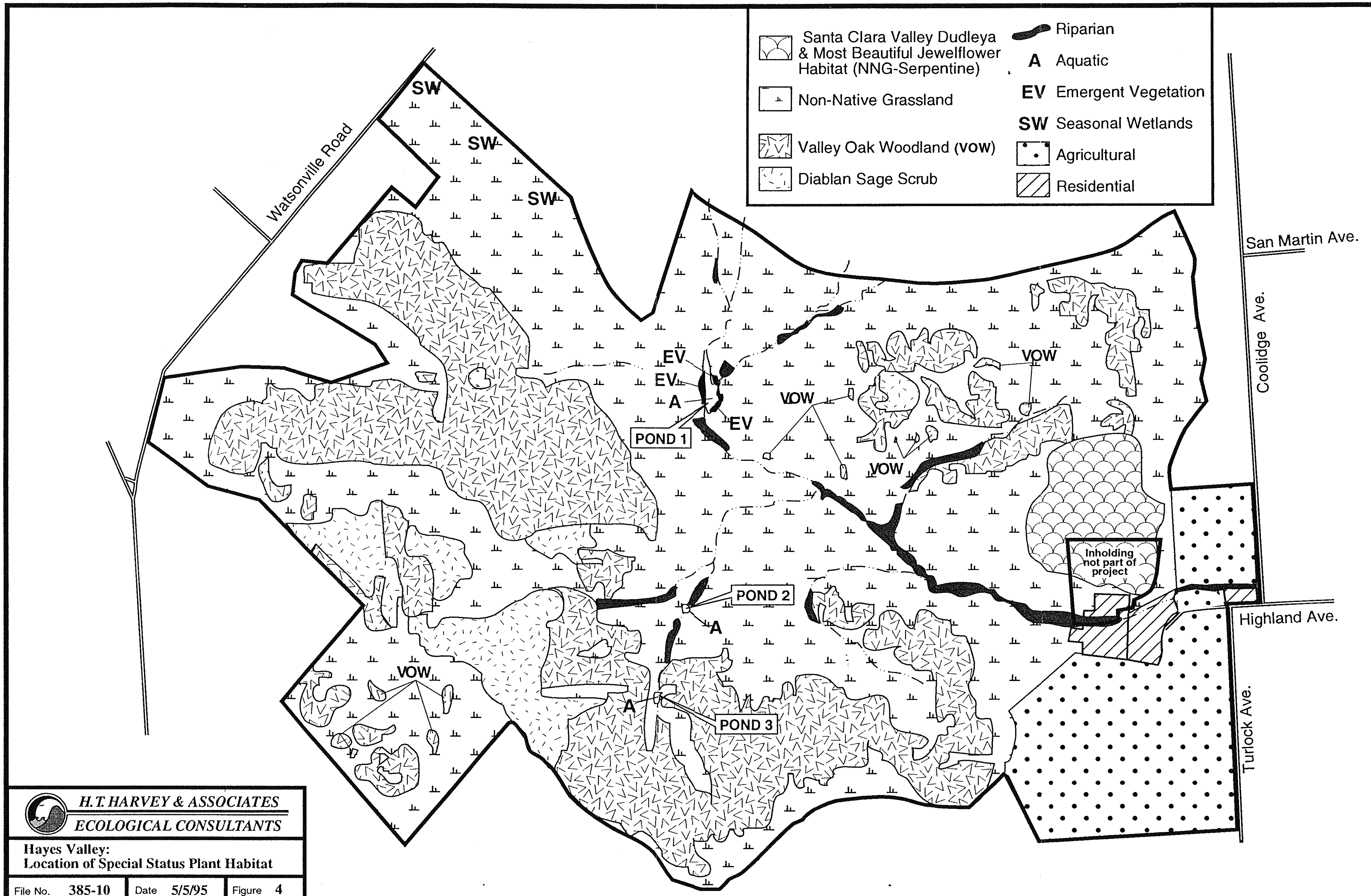
Most Beautiful Jewelflower (*Streptanthus albidus* ssp. *peramoenus*). Federal listing status: Candidate 1; State listing status: None; CNPS List: 1B. This close relative of the Metcalf Canyon jewelflower is found in similar habitats in geographically-separated areas. This species has been found on serpentine in the Oakland Hills and in Santa Clara County west of Coyote Creek. The flowering period for the most beautiful jewelflower ranges from April to May. Approximately 10,000 individuals were observed during 1992 surveys, on the south-, east-, and west-facing slopes of the serpentine hills in the northeastern portion of the site. The number of individuals of this annual species may be expected to show large year-to-year fluctuations. The Santa Clara Valley dudleya and most beautiful jewelflower occupy roughly the same portion of the site (Fig. 4).

Santa Clara Red Ribbons (*Clarkia concinna* ssp. *automixa*). Federal listing status: Candidate 2; State listing status: None; CNPS List: 1B. Santa Clara red ribbons occurs in mesic, shaded woodland habitats of Alameda and Santa Clara counties. This plant has been reported from the Mt. Sizer quadrangle, northeast of the project site (Bowman 1987). The blooming period ranges from April to July. The woodlands of in the project area are generally dry, and therefore, do not provide the appropriate mesic habitat for this species. Santa Clara red ribbons, is, therefore, presumed to be absent from the study area.

Mount Hamilton Thistle (*Cirsium fontinale* var. *campylon*). Federal listing status: Candidate 2; State listing status: None; CNPS list: 1B. This coarse thistle is a serpentine endemic that occurs most commonly in wet soils associated with springs, seeps, streams, and canyon bottoms. The blooming period ranges from April through October. Mount Hamilton thistle was not found during special-status surveys and is, therefore, presumed to be absent from the study area.

Fragrant Fritillary (*Fritillaria liliacea*). Federal listing status: Category 2; State listing status: None; CNPS List: 1B. This bulbous plant is found in widely scattered locations in central California in coastal scrub and grassland habitats. All but one of the known populations of this species in Santa Clara County occurs on serpentine, however, some populations in Marin, Alameda, and Sonoma Counties occur on non-serpentine substrates, generally in moist locations. The general blooming period for this species ranges from February to April, however, populations south of San Francisco Bay finish blooming by mid- to late March. Previous surveys for this species were probably conducted too late to identify this species. Fragrant fritillary potentially occurs in the northeastern serpentine area of the site, but is extremely unlikely to occur in the non-serpentine areas.

Big scale balsamroot (*Balsamorhiza macrolepis* var. *macrolepis*). Federal listing status: None; State listing status: None; CNPS List: 1B. Big scale balsamroot occurs in open grassy areas in woodlands and in grasslands, sometimes on serpentine soils. The blooming period of this species ranges from March to June. The only two reported occurrences of this species in the vicinity are from the east side of the Santa Clara Valley, approximately five miles to the east and northeast of the project site, near Coyote reservoir, apparently on non-serpentine soils. No balsamroot species were observed during numerous surveys of the site. Big scale balsamroot, therefore, is presumed to be absent from the study area.



Hayes Valley:
Location of Special Status Plant Habitat

File No. 385-10 | Date 5/5/95 | Figure 4

Hall's Bush Mallow (*Malacothamnus hallii*). Federal listing status: None; State listing status: None; CNPS List: 1B. Hall's bush mallow is usually found on stony slopes in chaparral communities of Contra Costa, Merced, and Santa Clara Counties. The blooming period of this shrubby species ranges from May to September. No Hall's bush mallow were observed during field surveys. This species is, therefore, presumed to be absent from the study area.

Serpentine linanthus (*Linanthus ambiguous*). Federal listing status: None; State listing status: None; CNPS List: 4. Serpentine linanthus occurs in woodlands, coastal scrub, and grasslands, usually on serpentine substrates. The blooming period ranges from March to June. This small annual plant is present on the serpentine hillsides in the northeastern potions of the site. The distribution of this species on-site is similar to that of the Santa Clara Valley dudleya and most beautiful jewelflower. No estimates of its abundance have been made.

Special-status Animal Species.

Information about possible threatened, endangered, or other special-status animal species of the area was collected from several sources. These sources included the California Department of Fish and Game's Natural Diversity Data Base, California Wildlife Habitat Relationships species notes, and miscellaneous information available through the U.S. Fish and Wildlife Service, California Department of Fish and Game, Santa Clara County Sensitive Species Maps, and technical publications.

Table 2 lists the potential for occurrence of the special status wildlife species, their status, and their potential for occurrence on the site. Suitable habitat exists on site to support resident populations of several species. Transients, such as the Sharp-shinned Hawk (*Accipiter striatus*), Ferruginous Hawk (*Buteo regalis*), and Merlin (*Falco columbarius*) may occasionally forage on site. Invertebrate species other than fairy shrimp are discussed in a separate report by the Center for Conservation Biology, Stanford University. Expanded descriptions are included of only those species for which potentially suitable breeding habitat occurs on the project site, for which surveys were conducted, or for which the resources agencies have expressed particular concern.

State or Federal Endangered or Threatended Species, or Proposed for State or Federal Status.

Longhorn Fairy Shrimp (*Branchinecta longiantenna*). Federal listing status: Endangered (September 19. 1994); State listing status: none. The longhorn fairy shrimp is a California endemic occupying seasonally astatic pools and either grass-bottomed swales or clear sandstone depression pools. The longhorn fairy shrimp is known from four disjunct populations along the eastern margin of the central coast range from Concord, Contra Costa County south to Soda Lake in San Luis Obispo County: the Kellogg Creek watershed, the Altamont Pass area, the western and northern boundaries of Soda Lake on the Carrizo Plain and Kesterson National Wildlife Refuge in the Central Valley (Eng *et al.* 1990, Sugnet & Associates 1993, 59 FR 48136). The geographically narrow distribution of this species was confirmed by extensive sampling by Sugnet & Associates (1993). Based on a reconnaisance-level survey of site conditions and the known species distribution, the longhorn fairy shrimp is not expected to occur on site.

Vernal Pool Fairy Shrimp (*Branchinecta lynchi*). Federal listing status: Threatened (September 19, 1994); State listing status: none. The vernal pool fairy shrimp occurs in ephemeral freshwater pools in sandstone outcrops. This species has a wide distribution extending from Stillwater Plain in Shasta County through most of the length of the Central Valley to Pixley in Tulare County, and along the central coast range from northern Solano County to Pinnacles in San Benito County (Eng *et al.* 1990, Sugnet & Associates 1993, 59 FR 48136). While the vernal pool fairy shrimp occurs widely in California, it is does not occur in high densities and has a sporadic distribution within vernal pool complexes (59 FR 48136 1994). Seasonal wetlands occurring in the northwest corner of the site may provide suitable habitat for this species. However, based on the known species distribution and preliminary surveys, this species is not expected to occur on site.

California Linderiella (*Linderiella occidentalis*). Federal listing status: Delisted (September 19, 1994); State listing status: none. The USFWS in September 1994 determined that the uplisting to endangered or threatened of California Linderiella was no longer warranted due to its relative abundance and distribution. California linderiella occurs in ephemeral pools that are either grass-bottomed swales or sandstone depression pools (Eng *et al.* 1990). This species is relatively common and occurs in 25 of California's 58 counties, from Tehama to Riverside (Eng *et al.* 1990, Sugnet & Associates 1993). Seasonal wetlands found in the northwest corner of the site may provide suitable habitat for this species. This species is the most likely to occur on the property. However, extensive surveys were not conducted on the property to verify presence or absence.

Vernal Pool Tadpole Shrimp (*Lepidurus packardi*). Federal listing status: Endangered (September 19, 1994); State listing status: none. Pools containing vernal pool tadpole shrimp have clear to highly turbid water and range in size from 5 m^2 to 36 ha. These pools may be highly turbid and mud-bottomed or grass-bottomed in old alluvial soils underlain by hardpan. Vernal pool tadpole shrimp are known from 18 populations in the Central Valley, ranging from east of Redding in Shasta County south through the Central Valley to the San Luis National Wildlife Refuge in Merced County, and from a single vernal pool complex in the San Francisco National Wildlife Refuge in the City of Fremont, Alameda County (Sugnet & Associates 1993, 59 FR 48136). The pools in the northwest corner of the property appear to be too shallow and short-lived to offer suitable habitat for the vernal pool tadpole shrimp.

San Joaquin Kit Fox. (*Vulpes macrotis mutica*). Federal listing status: Endangered; State listing status: Threatened. At one time the kit fox occurred extensively throughout California's Central Valley and parts of the Salinas and Santa Clara Valleys. Loss of habitat from urban, agricultural, and industrial development has severely reduced their former range (Morrell 1975). The San Joaquin kit fox typically occurs in annual grassland or mixed shrub/grassland habitats throughout low, rolling hills, and flatlands. They are generally most active in the late afternoon and evening. Their diet consists predominantly of kangaroo rats (*Dipodomys* spp.), rabbits, and hares in the southern part of their range and California ground squirrels in the northern part (Morrell 1972).

Home range size of kit foxes in the southern portion of their range is about 1-2 miles with extensive overlap among individuals (Morrell 1972). Kit foxes are solitary from mid-summer through late fall and occur in family groups from late fall through early summer. Breeding occurs from December through February and the pups are usually born in February and March. They typically produce 1 litter per year averaging 4 pups (McGrew 1979). The pups stay with the parents until June or July (Morrell 1972).

Availability of suitable dens is a major limiting factor for the kit fox. These foxes usually excavate and modify existing ground squirrel burrows for dens because of their generally poor ability to dig. Individual foxes may use more than 20 den sites annually while family groups may use as many as 43 den sites (Orloff et al. 1986). Dens are usually located on loose-textured soils on slopes less than 40 degrees (O'Farrell et al. 1980). However, Orloff et al. (1986) reported that in the northern part of their range kit fox dens occurred most frequently on slopes of between 2 and 14 degrees. Natal or pupping dens tend to be found on slopes of less than six degrees (O'Farrell and McCue 1981).

No kit foxes nor evidence of their presence (i.e., tracks, scats, etc.) were detected during evening spotlighting, scent/track station surveys, or line transects conducted in January 1988 (H. T. Harvey and Associates 1988). The project site is now accepted by state and federal agencies as being well outside the present range of the kit fox. Therefore, kit foxes are presumed absent from the site.

California Tiger Salamander (*Ambystoma californiense*). Federal listing status: Candidate 1, proposed for listing; State listing status: Species of Special Concern. The California tiger salamander is a large salamander with distinctive yellow or cream-colored spots on a black body. This species is found in moderate numbers in riparian and wet meadow habitats, but the adults are more commonly found in the burrows of pocket gophers or California ground squirrels in grasslands. Breeding and juvenile habitat requirements include a temporary (3 to 4 months) or permanent water source. Adults often emerge at night during the first moderate to heavy winter rains. They will migrate up to 0.75 miles to nearby vernal pools, or man-made ponds, where they lay their eggs. The adults remain between one and four months in the pool, feeding at night on invertebrates. The eggs are attached singly, or in clumps, to vegetation under water, or on the bottom of the pool if emergent vegetation is lacking. The eggs hatch approximately one week after they are deposited. The larvae prey upon invertebrates and other amphibian larvae for between three and six months, during which time they metamorphose into juveniles. Juveniles typically migrate in large numbers during a one- to two-week period, during which they search for available rodent burrows. Juveniles hibernate in these burrows until the following winter, if there is sufficient precipitation for emergence and reproduction.

Tiger salamanders take several years to reach maturity and do not necessarily breed every year, even if sufficient habitat is present. They are essentially restricted to the Central Valley and Coast Range of California from Butte County south to Santa Barbara County. They have disappeared from a significant portion of their range due to habitat loss from agriculture and urbanization and the introduction of non-native aquatic predators (i.e., fishes such as bluegill, *Lepomis macrochirus*; largemouth bass, *Micropterus salmoides*; and mosquitofish, *Gambusia affinis*; and bullfrogs, *Rana catesbeiana*).

Reconnaissance-level surveys for this species were conducted in the late winter of 1989 and the spring of 1990. One adult California tiger salamander was found on site in April of 1990. More intensive surveys, including dip-netting of the three stock ponds on site, were conducted in April, May, and June 1992. Approximately 75, 8, and 1 larvae were captured in pond number 2 in April, May, and June, respectively, and five larvae were captured in pond 3 in May (H. T. Harvey and Associates 1992, see Fig. 2). The presence of larval tiger salamanders indicates that a resident population exists on site. The numerous California ground squirrel, Botta's pocket gopher, and California vole burrows present in proximity to ponds would also provide suitable refugia for tiger salamanders during their summer aestivation period.

California Red-legged Frog (*Rana aurora draytonii*). Federal listing status: Candidate 1; State listing status: Species of Special Concern (S). The California red-legged frog is a medium-sized frog with reddish-colored legs. This species is generally restricted to riparian habitats in California and northern Baja California. Red-legged frogs prefer deep, quiet pools (greater than 3 feet deep) in creeks, rivers, or lakes below 1,000 meters in elevation (about 3,000 feet). Habitat requirements include fresh emergent or dense riparian vegetation, especially willows adjacent to shorelines. Red-legged frogs can survive in seasonal bodies of water that are dry for short periods if there is a permanent water body or dense vegetation stands nearby. The adults are normally active at night and breed in ponds in creeks or in marshes during the late winter or early spring after waters recede. Females attach eggs in a single cluster to a vegetation brace just under the surface of the water. The eggs hatch in just over a week and the resulting larvae feed on plant and animal material on the bottom of the pond. It takes at least 4 months for the larvae to metamorphose into juvenile frogs.

Juvenile frogs are predaceous, and are normally active both day and night, but gradually shift to a more nocturnal activity pattern. Adults normally reach sexual maturity in 2 to 3 years after metamorphosis. This species is active throughout the year, although they may estivate in vegetation thickets during flood events or cold weather. Red-legged frogs once ranged from the Coast Ranges of California from Point Reyes south to northern Baja California and east through the Central Valley to the Sierra Nevada foothills. But they have disappeared from about 75% of their historic range due to habitat loss from agriculture and urbanization and the introduction of non-native aquatic predators (e.g., fishes and bullfrogs, *Rana catesbeiana*) (Hayes and Jennings 1988).

No eggs, larvae, nor adult red-legged frogs were detected during surveys conducted in April and May, 1992 by a qualified herpetologist (H. T. Harvey and Associates 1992). Therefore, the California red-legged frog is presumed absent from the site.

California Species of Special Concern, State Protected, or Federal Candidate Species

Western Pond Turtle (*Clemmys marmorata*). Federal listing status: Candidate 2 (FC2); State listing status: Species of Special Concern (S). The western pond turtle is a medium-sized brown or olive-colored aquatic turtle, and is found west of the Sacramento-San Joaquin Delta, and south to northern Baja, except in desert areas. The pond turtle is normally found in and along riparian areas, although gravid females have been reported up to a mile away from water in search of an appropriate nest sites. The preferred habitat for these turtles includes ponds or slow-moving water with numerous basking sites (logs, rocks, etc.), food sources (plants, aquatic invertebrates, and carrion), and few predators (raccoons, introduced fishes, and bullfrogs). Juvenile and adult turtles are commonly seen basking in the sun at appropriate sites, although they are extremely wary animals and often dive into the water at any perception of danger.

Adults breed in the spring and early summer (March-July). Typical nests are excavated by females in hard-packed clay soil in open habitats (usually on southfacing slopes) within a couple of hundred yards from the water course; however, nests have been located up to 0.4 miles from water. The female will then lay between 1 to 15 eggs which are left to incubate for 3 to 4 months.

Young turtles will either leave the nest shortly after hatching or overwinter in the nest until the late winter rains. Young hatchlings are quite small and feed mainly on aquatic invertebrates in shallow, moss-covered waters. These turtles reach sexual maturity at about 8 years of age. They are also relatively long-lived and may reach 40 years in the wild. They have disappeared from a significant portion of their range due to habitat loss from agriculture, urbanization, water development projects, and the introduction of non-native aquatic predators (i.e., fishes and bullfrogs).

At least five western pond turtles were observed in pond 1 during sampling for amphibian larvae in June, 1992 (H. T. Harvey and Associates 1992). However, no pond turtles were captured or observed during earlier sampling surveys of the three ponds and the drainage by a herpetologist in April, 1992. The stock ponds and ephemeral drainage on site provide suitable habitat for this species. The absence of bullfrogs on site probably increases the chances of survival of pond turtles.

White-tailed Kite (*Elanus caeruleus*). Federal listing status: None; State listing status: Protected. This species prefers habitats with low ground cover and variable tree growth. Kite nests are built near the tops of oaks, willows, or other dense broad-leafed deciduous tress in partially cleared or cultivated fields, grassy foothills, marsh, riparian, woodland, and savannah. Kites prey primarily on small rodents (especially the California vole), but also feed on birds, insects, reptiles, and amphibians. When prey is abundant these birds may rear two broods in a single breeding season. Once considered endangered, the kite is now fairly common, though fully protected, in the state of California.

Suitable breeding habitat exists for this species on site in the sycamore trees along the valley floor, as well as within the dense oak woodland habitat throughout the site. There also appears to be an adequate insect and small mammal prey base to support breeding kites. Although no White-tailed Kites were observed on site during surveys, this species would be expected to occur.

Northern Harrier (*Circus cyaneus*). Federal listing status: None; State listing status: Species of Special Concern. The Northern Harrier is commonly found in open grasslands, agricultural areas and marshes. Nests are built on the ground in areas where long grasses provide cover and protection (Ehrlich et al. 1988). Harriers hunt for a variety of prey, including rodents, birds, frogs, reptiles, and insects by flying low and slow in a traversing manner utilizing both sight and sound to detect prey items.

The emergent vegetation partially surrounding stock ponds 1 and 2 on site is not extensive enough to support nesting Northern Harriers. This species requires dense, tall emergent, or weedy vegetation in which to build nests. Northern Harriers were observed foraging during the winter on site.

Sharp-shinned Hawk (*Accipiter striatus*). Federal listing status: None; State listing status; Species of Special Concern. The Sharp-shinned Hawk is commonly found in dense woodland or riparian habitats bordering open areas. Sharp-shinned Hawks typically pursue small birds in semi-open country, at the edges of open woodlands, in clearings, along hedgerows, shorelines, or along passerine migration corridors. Nest sites are usually within 90 meters of a water source and located in dense stands of even-aged trees on north facing slopes. Fledging of young hawks coincides with that of the songbirds in the area which allows the young of the year to practice foraging on inexperienced prey.

Sharp-shinned Hawks surely move through the site in spring and fall, during periods of migration. They may also spend a portion of the winter months foraging for small birds and other prey on the site. Although the site does not provide dense stands of conifers or other even-aged trees for nesting, the oak woodland habitat of the site may provide less optimal to marginal nesting habitat for Sharp-shinned Hawks. There are scattered breeding records for this species in the Bay Area. Sharp-shined Hawks were observed foraging on site.

Cooper's Hawk (*Accipiter cooperii*) Federal listing status: None; State listing status; Species of Special Concern. The Cooper's Hawk is a larger accipiter than the Sharp-shinned Hawk and thus, this species can prey upon medium-sized birds (e.g., jays, doves, and quail) and occasionally takes small mammals and reptiles. The Cooper's Hawk prefers landscapes where wooded areas occur in patches and groves which facilitates the ambush hunting tactics employed by this species. Breeding pairs in California prefer nest sites within dense stands of live oak woodland or riparian areas and prey heavily on young birds during the nesting season. The extensive and varied character of the oak woodland on site offers abundant nesting opportunities for the Cooper's Hawk. The patchiness of the canopy enhances foraging opportunities for this species. The presence of a large number and variety of oaks and other large trees render the site suitable for breeding Cooper's Hawks. Cooper's Hawks were frequently observed foraging on site.

Golden Eagle (*Aquila chrysaetos*). Federal listing status: Protected by the Bald Eagle Protection Act (16 U.S.C. 668-6686) and the Migratory Bird Treaty Act (16 U.S.C. 701-711); State listing status: Species of Special Concern, Protected. The Golden Eagle is an uncommon permanent resident and migrant in California. Golden Eagles forage upon a variety of prey, but show a preference for rabbits and rodents. The home range of breeding pair of eagles may include a number of alternate nests, usually located on cliffs, in large trees, or on high tension towers. Only one of these sites is used each year for breeding. Golden Eagles, their nests, and eggs are fully protected in the state of California by the California Department of Fish and Game. In addition, Golden Eagles and their nests are federally protected under the Bald Eagle Protection Act and the Migratory Bird Treaty Act.

Golden Eagles may have nested on site in 1989 (Fig. 3). This eagle nest was discovered in July and August of 1989 after the breeding season, but the presence of numerous feathers, prey remains, ground was covered with eagle excrement, etc. strongly suggested recent use (see Fig. 3). A pair of eagles was observed foraging on the site, and several day and night roosts were discovered during the summer of 1989. An inactive nest was also found during that survey period. A maximum of seven Golden Eagles (five adults, one sub-adults, and one first-year bird) were observed foraging on the site during late winter and early spring of 1990. One family group, which included a pair of adults and the first year eagle, were regarded as permanent residents, and remained on site during the spring of 1990.

Intensive surveys for Golden Eagles were conducted on site in late May and June 1992. All accessible potential Golden Eagle nest trees were searched for nests. Two pairs of adult Golden Eagles and one subadult were observed on site during these surveys (H. T. Harvey and Associates 1992). Two pairs performed aerial displays, indicating a probable territorial boundary on the north slope of Lion's Peak. One adult also foraged consistently over the valley floor and along the southern boundary of the site. A nest with two nearly fledged young was discovered off site on the south side of Lion's Peak in June, 1992 (H. T. Harvey and Associates 1992). A pair of Golden Eagles (probably the same pair) nested successfully and produced one fledged young in 1993. Although the nest was not active during a nest survey in April, 1994, one adult displayed breeding behavior in the vicinity of the inactive nest, which indicates that the pair may be using an alternate nest in the same or adjacent drainage.

Burrowing Owl (*Speotyto cunicularia*). Federal listing status: Migratory Bird Treaty Act (16 U.S.C. 703-711; State listing status: Species of Special Concern. The Migratory Bird Treaty Act (U.S.C. 703-01) prohibits the "taking of active nests, eggs, young, or adults" of Burrowing Owl. CDFG recommends that lead agencies consider disturbances of Burrowing Owl nest sites as adverse significant impacts. They also recommend mitigation measures to reduce the impacts to a level of insignificance. The Burrowing Owl is a small, terrestrial owl of open country. Burrowing Owls favor flat, open grassland or gentle slopes and sparse-shrubland ecosystems. These owls prefer annual and perennial grasslands, typically with sparse or nonexistent tree or shrub canopies. In

California Burrowing Owls are found in close association with California ground squirrels (*Spermophilus beecheyi*). Owls use the abandoned burrows of ground squirrels for shelter and nesting.

Several Burrowing Owls were observed on site during reconnaissance surveys conducted during January of 1988 (H. T. Harvey and Associates 1988). One individual was observed during a site visit during 1988 (D. Hartesveldt pers. comm.). However, no owls have been observed on site during subsequent visits. There were two accounts of Burrowing Owls in the vicinity of Day Road, to the south of the site, in 1993 (L. Randall pers. comm.), but the accounts were unverified. The presence of numerous California ground squirrel burrows within the non-native grassland habitat throughout the valley as well as along some of the low-lying hills provides abundant suitable habitat for Burrowing Owls. Therefore, although Burrowing Owls have not been observed on the site since 1988, they could occur on site in future years.

California Horned Lark (*Eremophila alpestris actia*). Federal listing status: Candidate 2; State listing status: None. Grinnell and Miller (1944) list 13 subspecies of Horned Lark in California. One of these subspecies, the California Horned Lark, is currently a federal candidate (level 2) for listing as a threatened or endangered species. This subspecies is a widespread breeder along the coast and in the Central Valley of California and it represents the only subspecies that breeds in the general region of the site. This species may breed in suitable habitat on the site. Several other subspecies of Horned Lark occur in the region during migration and winter. However, it is not possible to identify these birds to subspecies without collecting them.

The non-native serpentine and non-serpentine grasslands, which cover the majority of the site, provide abundant suitable nesting habitat for the California Horned Lark. Therefore, this species would be expected to breed on site.

Loggerhead Shrike (*Lanius ludovicianus*). Federal listing status: Candidate 2; State listing status: None. In approximately the past twenty years, some populations of the Loggerhead Shrike have declined significantly. These populations are primarily in eastern North America. However, other populations, including those in western North America, appear to be decreasing as well. In California, Loggerhead Shrikes are still considered a fairly common species. Shrikes generally build their nests in dense shrubs or bushes in open areas.

Many areas within the oak woodland support a dense understory of herbaceous vegetation, including poison oak, which would provide appropriate nesting substrate for this species. Therefore, Loggerhead Shrikes are expected to breed on site.

California Yellow Warbler (*Dendroica petechia brewsteri*). Federal listing status: none; State listing status: Species of Special Concern. Numbers of breeding pairs of California Yellow Warblers have declined dramatically in many lowland areas to such an extent that the species has been designated a Species of Special Concern. The male Yellow Warbler is brilliant yellow with reddish-brown vertical streaking on the breast. This insect-eater is primarily found in deciduous riparian habitats comprised of alders, cottonwoods, willows, and other small trees and shrubs. The Yellow Warbler feeds on spiders and insects, as well as a few berries. This warbler builds a compact nest of weed stalks, shredded bark and grass high up in a deciduous sapling or shrub. Yellow Warblers migrate mostly to Mexico and South America in the fall and return to California to breed in April. Some birds overwinter in southern California lowlands.

The willows growing within the drainage near pond 1 (see Fig. 2) would provide some breeding habitat for Yellow Warblers. However, because the willows are not extensive and are somewhat isolated, it is more likely that this species would only occur (if at all) as a migrant during spring and fall.

Tricolored Blackbird (*Agelaius tricolor*). Federal listing status: Candidate 2; State Listing Status: Species of Special Concern. Tricolored Blackbirds are found almost exclusively in the Central Valley and central and southern coastal areas of California. In 1992, surveys by the California Department of Fish and Game determined that the population of this species was much larger than previously believed. Thus, the concern for the species lessened considerably.

The Tricolored Blackbird is highly colonial in its nesting habits and forms dense breeding colonies of up to tens of thousands of pairs. This species typically nests primarily in tall, dense, stands of cattails or tules, but also nests in blackberry, wild rose bushes and tall herbs. Nesting colonies are typically located near standing or flowing freshwater. Tricolored Blackbirds form large, often multi-species, flocks during the nonreproductive period and range more widely than during the reproductive season.

The dense stand of emergent spike-rush, of up to 200 feet in width, surrounding pond 1 (see Fig. 2) would provide suitable breeding habitat for Tricolored Blackbirds. This species often breeds in different locations in successive years and it is, therefore, difficult to predict its use of habitat on site. Suitable foraging habitat exists for this species throughout the non-native grassland areas on site.

Ringtail (*Bassariscus astutus*). Federal listing status: None; State listing status: Fully Protected, CDFG Code 4700. Ringtails are a close relative of the raccoon. They inhabit cavities in rock outcrops, talus slopes, and hollows in trees, logs and snags. Ringtails are usually not found more than 0.8 km from permanent water. This secretive carnivore is nocturnal and feeds mainly on rodents and rabbits and less frequently on birds, reptiles, invertebrates, fruit, nuts, and some carrion. No ringtails were observed during any of the field surveys, but they are expected to occur within the valley oak woodland and riparian woodland habitats on site.

American Badger (*Taxidea taxus*). Federal listing status: None; State listing status: Species of Special Concern. The American badger is a nocturnal carnivore that occurs within most of California in the drier open regions of grasslands, shrublands, and wooded areas. Habitat requirements include loose, dry soils (which aid in digging), and an abundance of small avian or mammalian prey. The abundance of California ground squirrel burrows throughout the low-lying areas on site, as well as the abundance of the non-native grasslands in the valley, provide suitable habitat for the badger. There is also adequate cover provided at the grassland edges by trees and shrubs. In addition, a large burrow of appropriate size for a badger was discovered on site in May, 1993. It is, therefore, likely that badgers occur on site.

REGULATED HABITATS

Streambed Alteration Regulations

According to Sections 1601 and 1603 of the California State Fish and Game Code, the California Department of Fish and Game (CDFG) has jurisdiction over the bed and bank of drainage channels in the state. All tributaries of the site would be subject to CDFG jurisdiction.

Jurisdictional Waters

Various portions of the site are under the jurisdiction of the U. S. Army Corps of Engineers. A wetland delineation has been prepared by LSA (1994).

ENVIRONMENTAL IMPACTS

Implementation of the proposed Hayes Valley project would have a number of potential effects on the area's biological resources. These adverse effects may or may not significant. *CEQA, Statute and Guidelines* provides guidance in evaluating project impacts and determining which will be significant. CEQA has defined "significant effect on the environment" as "a substantial adverse change in the physical conditions which exist in the area affected by the proposed project". According to Appendix G of CEQA, *Statute and Guidelines*, a project's effects on biotic resources will be considered significant when the project will:

(a) substantially affect a rare or endangered species of animal or plant or the habitat of the species;

(b) interfere substantially with the movement of any resident or migratory fish or wildlife species;

(c) substantially diminish habitat for wildlife or plants.

EFFECTS FOUND TO BE LESS-THAN-SIGNIFICANT

The biological resources listed below are considered sufficiently abundant regionally that project impacts to them, when considered in the context of this project alone, would be less than significant. These biotic resources are otherwise unprotected by local, state, and federal laws. The amount of each habitat to be developed is listed in Table 3.

Table 3. Acres of Habitat to be Developed

Habitat Type	Acres Lost to Development	Acres Remaining
Non-native Grassland (non-serpentine)	246.0	627.7
Non-native Grassland/Wildflower Field (serpentine)	0.0	33.5
Valley Oak Woodland	0.0	480.0
Diablan Sage Scrub	0.0	82.0
Valley Oak/Sycamore Riparian Woodland	2.1	16.5
Aquatic	0.3	5.3
Emergent Vegetation	0.2	0.5
Seasonal Wetlands	0.3	3.7
Orchard/Cropland	164.0	0.0
Residential/Developed	9.0	4.9

Loss of Residential/Developed Areas from Project Development

Project development will result in the conversion of approximately 9 acres of currently developed lands into portions of a golf course (Table 3). The wildlife species that occur in the previously-developed area tend to be relatively common species that are regionally abundant. No special-status plant or animal species are known to use these residential/developed areas. Therefore, the loss of the Residential/Developed habitat will be a less-than-significant impact.

Loss of Non-native Grassland (non-serpentine) Resulting From Project Development

Implementation of the proposed project will result in the removal of approximately 246 acres of the total 874 acres of non-native grassland (non-serpentine substrate). Approximately 46 of the remaining 628 acres consist of relatively small grassland patches located between golf course fairways; the majority of the remainder will be included in designated open space. Although part of the cluster subdivision directly abuts a portion of the non-native grassland (serpentine), it is our understanding that none of this habitat will be lost. The non-native grassland (non-serpentine) habitat would be converted into a golf course, golf course facilities and residential areas. The loss of this habitat would reduce the overall carrying capacity of the site for a variety of animal species including the Red-tailed Hawk, Golden Eagle, White-crowned Sparrow, California Towhee, Western Meadowlark, California ground squirrel, California vole, western harvest mouse, red fox, and black-tailed deer. Thus, some terrestrial vertebrates will be lost from site development, or displaced to neighboring sites not presently developed. Non-native grassland is regionally abundant and the majority of the biotic resources associated with it will continue to be abundant following project completion.

Two special-status species known to occur on-site, the California tiger salamander and the western pond turtle, may utilize an unknown amount of the non-native grassland on site. The potential impacts and any appropriate mitigation to these species are being determined by LSA Associates, and will, therefore, not be addressed by H. T. Harvey and Associates.

The loss of non-native grassland from the site will not significantly affect botanical, avian, or mammalian resources. Refer to the sections in the EIR addressing impacts to the California tiger salamander and western pond turtle.

Loss of Orchard/Cropland from Project Development

Project implementation will result in the conversion of all 164 acres of orchard/cropland habitat on site to residential development. Plant and wildlife species that occur within this habitat are relatively common species that are regionally abundant. Therefore, the loss of orchard/cropland from the site will be a less-than-significant effect.

Loss or Degradation of Valley Oak Woodland

Approximately 21 acres of the 480 acres of valley oak woodland on-site are located within the 3 largest proposed residential parcels (lots 1, 2, and 8). The woodlands are located on the upper, hilly portions of the parcels; the lower flatter areas are vegetated with non-native grassland. The flatter, non-native grassland portions of these parcels are equivalent to, or larger in size, than entire adjacent residential lots. We presume that only these lower portions of the lots will be developed, and no direct losses of oak woodland will occur. Our experience on several previous projects indicates that residential development on such large lots adjacent to woodlands has little or no effect on the woodlands themselves. The remaining 459 acres (96% of the total) of valley oak woodlands on-site will be included in permanent open space. Because no direct losses will occur, and only 4% of the woodlands of the site are within these parcels, inclusion of valley oak woodlands in the residential parcels will not be a significant effect.

The driveway to the clubhouse from the primary access road off of Highland Avenue will cross within the dripline of a couple of trees. It is possible that grading within the dripline of these trees may result in damage of the root structure and eventual death of the trees. The potential damage caused by grading within the dripline of a couple of trees will not result in a significant impact since 459 acres of oak woodland habitat will be included in the permanent open space for the project.

Loss of Habitat for Various Special-Status Plant and Animal Species

Several special-status plant and animal species have been identified as historically or currently occurring in the project vicinity. On the basis of field work conducted within the project development area and the hilly regions to the north, it has been determined that several special-status plant species either do not occur or are very unlikely to occur on site. These species include Coyote ceanothus, Metcalf Canyon jewelflower, showy Indian clover, Contra Costa goldfields, Mount Hamilton thistle, Hall's bush mallow, Santa Clara red ribbons, and big scale balsamroot. Project impacts to these species are expected to be less-than-significant.

The project site is outside the known distribution for five animal species listed in Table 2. These include the Vernal Pool Tadpole Shrimp, Longhorn Fairy Shrimp, Vernal Pool Fairy Shrimp, western spadefoot toad, and the San Joaquin kit fox. No records exist for the Longhorn Fairy Shrimp, Vernal Pool Fairy Shrimp, or the western spadefoot toad in Santa Clara County. Kit foxes were once common throughout the Central Valley as well as portions of Salinas and Santa Clara Valleys. No evidence of kit fox were found on or adjacent to the project site during extensive surveys, including night searches (scent/track station monitoring and night spotlighting), and daytime transects were conducted on the site in 1988 (H. T. Harvey and Associates 1988). The San Martin area including Hayes Valley is no longer considered part of the historic or presently occuppied kit fox range. Therefore, the loss of habitat as a result of project development would be considered a less-than-significant impact for these five species since the project site is outside their known ranges.

Some special-status terrestrial vertebrates may be occasional visitors, migrants, or transients. These species include the Northern Harrier, Ferruginous Hawk, Merlin, American Peregrine Falcon, Prairie Falcon, Long-billed Curlew, Willow Flycatcher, and Yellow Warbler. The Townsend's big-eared bat, pallid bat, and western mastiff bat may forage for insects over the site, but there is no suitable roosting habitat available to them on site. The proposed project will have no effect on the breeding success of any of these species, although it will result in a small reduction of foraging habitat available to them regionally. This small reduction is considered to be a less-than-significant impact.

The Vernal Pool Tadpole Shrimp is reported to occur in Northern Santa Clara County in the San Francisco Bay refuge, but the site does not support suitable habitat for the tadpole shrimp and it is outside its known range.

The California horned lizard was observed on site. The majority of the appropriate habitat for this species (valley oak woodland) will not be lost due to project development. Hence, project related impacts to this lizard are considered a less-than-significant impact due to the abundance of suitable habitat remaining as open space on site and regionally.

Golden Eagles are not presently nesting within the project boundaries and the closest known Golden Eagle nest is 0.25 miles from the project boundary on the south side of Lions Peak (see Fig. 3). This nest is more then 0.5 miles from any project related development and is also not within line of site of any proposed development. Therefore, project buildout will have a less-than-significant effect on the reproductive success of the Golden Eagle nest on the south side of Lions Peak (see, however, the section of Potential Disturbances to Raptor Nests in the *Projects Impacts Found to be Significant* for the potential of Golden Eagle nesting within the valley again prior to development).

Golden Eagles have been observed foraging on site for California ground squirrels, which are relatively common in most areas of the valley floor. The eagles are likely to shift their foraging efforts to adjacent grasslands where their primary prey, ground squirrels and black-tailed hares, are also abundant. Non-native grasslands, which support an abundance of ground squirrels and black-tailed hares, are one of the most common habitats presently undeveloped in south Santa Clara County. Golden Eagles forage between 20-66 square miles depending upon the quality of habitat (Scott 1985, Palmer 1988). Eagles in San Diego County in similar habitats to Hayes Valley average a foraging range of 36 square miles (Palmer 1988). The relatively small reduction in the regional foraging habitat for the Golden Eagle does not meet the test of significance as outlined in the CEQA guidelines, Appendix G (i.e., "substantially diminish habitat for wildlife and plants"). Hence, the loss of 246 acres or approximately 39% of the grasslands (both non-serpentine and serpentine substrate) on site due to project implementation is expected to constitute a less-than-significant impact to foraging habitat for Golden Eagles.

White-tailed Kite, Sharp-shinned Hawk, and Cooper's Hawk use the project site for foraging. The proposed project would eliminate some foraging habitat for these species. Due to the abundance of similar habitat regionally, impacts to these species resulting from a small loss of foraging habitat are expected to be less than significant (see, however, Potential Disturbances to Raptor Nests in *Projects Impacts Found to be Significant*).

The California Horned Lark probably breeds on site. This species is a common breeder in Central California and has primarily been placed on the federal candidate list due to its severe decline in the coastal areas of southern

California. Additionally, the Loggerhead Shrike, which may breed on site, is fairly common in the San Francisco Bay Area (and in the state) and the population appears to be stable (see discussion in Existing Condition Section under Loggerhead Shrike). The project site represents a small fraction of the available breeding habitat for these two species in central California. Thus, project development will have a less-than-significant effect on the available breeding habitat for these two species.

The ringtail occurs primarily within the valley oak woodland and riparian woodland habitats. Approximately 96% of this habitat will remain open space on site. Therefore, the loss of a small amount of potential habitat is considered a less-than-significant impact.

A potential badger burrow was discovered on site May 1993. The project would eliminate habitat potentially used by badgers. Due to the abundance of grassland/woodland habitat remaining as open space on site and that which occurs regionally, impacts to badgers are expected to be less-than-significant.

The potential of project related impacts to those invertebrates not included in Table 2 and to the amphibian and reptile species listed in Table 2 are being assessed by the Center for Conservation Biology, Stanford and LSA, respectively.

PROJECT IMPACTS FOUND TO BE SIGNIFICANT

The biological resources listed below are considered sufficiently rare regionally that project impacts to them would be considered significant, or they are otherwise protected by local, state, and federal laws. Project related impacts to special-status invertebrates (other than fairy shrimp), tiger salamander, and western pond turtles listed in Table 2 are being addressed by other consultants. Project effects found to be significant include the following:

Loss of Special-Status Vascular Plants and their Habitats from Project Construction

Two special-status plant species are known to occur on site: Santa Clara Valley Dudleya and most beautiful jewelflower. In addition, a CNPS list 4 species, serpentine linanthus, occurs on site. Two other special-status species potentially occur on site, including Tiburon Indian paintbrush and fragrant fritillary. These species occur or potentially occur on the serpentine hills in the northeastern portion of the site. Under the current development plan, this region would be designated as permanent open space, and the plants and their serpentine habitat would not be subject to direct impacts. However, potential indirect impacts to this area are likely to result from the placement of housing, a horse stable and a golf course in close proximity to this area. The serpentine habitat is fragile, consisting of steep, sparsely vegetated hillsides with thin, rocky soils. Potential activities which may adversely affect the plants and their habitat include trampling by people, domestic pets, bicycles, and motorcycles. These indirect impacts to special-status species would be a significant adverse effect.

Reduction of Habitat Quality or Loss of Valley Oak/Sycamore Riparian Woodland

Approximately 14.8 acres of the total 18.6 acres of Valley Oak/Sycamore Riparian Woodland habitat of the site occur within the portion of the site to be developed; 13.9 acres are within proposed golf course property and 0.9 acres are within the proposed rural residential parcel on the eastern boundary. These riparian habitats are relatively degraded (see existing setting section) when compared with less disturbed habitats in the region.

Nonetheless the value of the Valley Oak/Sycamore Riparian Woodland within these parcels will be lessened due both to direct and indirect impacts. Approximately 1.7 acres of riparian vegetation will be removed; 0.4 acres will become "non-riparian" due either to diversion or filling of channels.

The primary access road (from Highland Avenue) will cross the main creek in Hayes Valley east of Holes 8 and 9. This road will be placed so as not to necessitate the removal of any riparian trees. Nonetheless, grading may occur within the dripline of a small number (i.e., 2-4) of trees within the riparian habitat. This grading may damage the root structure of these trees potentially resulting in eventual death of the trees.

The parking facilities adjacent to the creek near Holes 1, 10 and 18 will be set back 75 feet from the riparian habitat. In addition, the parking lot is being designed in such a way so stormwater will not drain in the creek system but into a retention basin. Therefore, these parking lots are not expected to contribute to impacts to the riparian habitats.

Indirect impacts include 1) conversion of natural habitats adjacent to the riparian zone; 2) human disturbances; and 3) reduction in water quality. In some locations, proposed irrigated turf and development occur up to and sometimes beneath the canopies of riparian trees. In addition, golfers may cross the creek where no bridges exist, trampling riparian vegetation searching for balls. Several holes which span either the largest creek or the minor tributaries of the site could enhance the potential for such disturbances. These include Holes 3, 4, 5, 6, 9 on the golf course. Runoff from the golf course may affect water quality. Potential water quality effects will be addressed elsewhere in the EIR.

The loss of riparian vegetation and the proximity of developed land will reduce the value of the Valley Oak/Sycamore Riparian Woodland to native wildlife. Numbers and diversity of wildlife species occurring along the intermittent creeks of the site are likely to decline during and after project implementation. The loss of riparian habitat and the reduction of riparian habitat values or loss of habitat is considered to be a significant environmental effect.

Additionally, fill, grading and excavation within this habitat are regulated by the CDFG and possibly by the USACE, and a permit from each of these agencies would be required prior to beginning such activities which may affect this habitat.

Loss of Seasonal Wetlands

Approximately 0.3 acres of the 4 acres of seasonal wetlands identified on-site by LSA (1994) are located within a proposed access road easement which enters the property from Watsonville Road. The floristic composition of these seasonal wetlands within and directly adjacent to the easement is rare in Santa Clara County (see Existing Conditions Section). Seasonal wetlands are generally considered by the CDFG to be of high priority. Therefore, the loss of any of this habitat is considered to be significant. Additionally, these seasonal wetlands may be subject to the jurisdiction of the U. S. Army Corps of Engineers (USACE), and fill of such areas may require a permit from the USACE.

Loss of Aquatic Habitat and Emergent Vegetation

Aquatic habitat, in the form of two stock ponds (ponds 1 and 2), some portions of seasonal drainage channels, and several stands of emergent vegetation associated with stock ponds and drainages are located within the proposed golf course. Approximately 0.7 acres of potential "tributary waters" within seasonal drainage channels, 0.3 acres of stock ponds and 0.2 acres of emergent vegetation will be affected by the proposed grading and filling. The approximate amounts of each habitat are listed in Table 4.

Table 4. Approximate areal extent of Aquatic Habitat and Emergent Vegetation.

Habitat	Impact (acres) Grading/Filling
Seasonal Drainages	0.7
Stock Ponds (aquatic)	0.3
Emergent Vegetation	0.2
Total	**1.2**

Wetland (represented by emergent vegetation) and aquatic habitats of the state are important for many native plants and animals. The loss of any of these habitats is considered to be significant. Additionally, such areas may be under jurisdiction of the USACE, and fill of such areas may require a permit from the USACE. The bed and banks of all seasonal drainage channels may also be under the jurisdiction of the California Department of Fish and Game (CDFG), and any alterations to such may require acquisition of a Streambed Alteration Agreement from the CDFG.

California tiger salamander and western pond turtle are known to occur in ponds of the site. The loss of habitat for these special-status species will be addressed separately by LSA Associates.

Disturbance to Burrowing Owl Nests from Construction Activities During Project Implementation.

Burrowing Owls were observed on the site in February, 1988, and suitable habitat exists in some areas of the non-native grassland habitat on site. Although no Burrowing Owls were observed during a site visit in April, 1994, there were at least 50 active California ground squirrel burrows in the central and western portion of the valley, and the habitat appeared to be suitable for owls. In addition, Burrowing Owls have been observed in 1993 and 1994 south of the site, and may disperse onto the project site prior to or following the breeding season. Disturbance that causes nest abandonment and/or loss of reproductive effort is considered "taking" by the CDFG.

Disturbance to Active Raptor Nests from Construction Activities During Project Implementation.

Raptors (e.g., eagles, hawks, and owls) and their nests are protected under both federal and state regulations. The federal Migratory Bird Treaty Act (16 U.S.C., Sec. 703, Supp. I, 1989) prohibits killing, possessing, or trading in migratory birds except in accordance with regulations prescribed by the Secretary of the Interior. This act encompasses whole birds, parts of birds, and bird nests and eggs. Birds of prey are protected in California under the State Fish and Game Code, Section 3503.5, 1992). Section 3503.5 states that it is "unlawful to take, possess, or destroy any birds in the order Falconiformes or Strigiformes (birds of prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto". Construction disturbance during the breeding season could result in the incidental loss of fertile eggs or nestlings, or otherwise lead to nest abandonment. Disturbance that causes nest abandonment and/or loss of reproductive effort is considered "taking" by the CDFG. Any loss of fertile eggs, nesting raptors, or any activities resulting in nest abandonment would constitute a significant impact. This would apply to Golden Eagles, Red-tailed Hawks, and other birds of prey.

Potential Degradation of Water Quality within Aquatic Habitats of Hayes Valley

Aquatic habitats of Hayes Valley include stock ponds and several intermittent creeks. Degradation of water quality within aquatic habitats of the site could potentially result from construction-related activities and from permanent changes in land use and management after project completion. The potential for degradation of water quality will not be assessed by H. T. Harvey and Associates, but will be addressed elsewhere in the EIR

Introduction of non-native species

Several exotic species used in landscaping commonly escape cultivation and become naturalized in adjacent native habitats. Typical species include French broom (*Genista monspessulana*), black locust (*Robinia pseudoacacia*), blue gum (*Eucalyptus globulus*), acacia (*Acacia* sp.) and periwinkle (*Vinca major*). The establishment of these and other exotics capable of naturalizing would constitute a significant adverse affect on the native vegetation of the site.

MITIGATION

Potential Impacts to Special-Status Vascular Plants and their Habitats from Project Construction

The following measures are proposed to reduce indirect effects to special-status plants and their habitat which occur directly adjacent to the project planning area.

The serpentine area should be fenced or signs should be posted in order to eliminate potential disturbance to special-status plants from human activity, domestic animal intrusion, and any other potential sources of disturbance. The only area on-site in which grading is proposed near the serpentine hills is part of the cluster subdivision. Prior to site grading, temporary fences should be constructed between the serpentine and the cluster subdivision. The fences should stay in place during project construction. Public access to the special-status plant habitat should be restricted in perpetuity. Brochures should be prepared by the project proponent, or a designee, and should be provided to all homeowners, stable users, etc. as part of a public education program about the presence of special-status plants and the value of such protected resources.

Reduction of Habitat Value or Loss of Valley Oak/Sycamore Riparian Woodland

The loss of any Valley Oak/Sycamore Riparian Woodland or reduction in habitat value is considered a significant impact. Additionally, activities within this habitat may be regulated by the CDFG and USACE, and a permit from each of these agencies may be required prior to beginning activities within these areas. Implementation of the following measures should reduce project impacts to a less than significant level

(1) Avoid removal of riparian trees when possible and avoid de-watering seasonal channels adjacent to riparian vegetation. Site the access road crossing as much as possible outside the dripline of any riparian trees. Riparian trees that are graded within the dripline should be monitored for a 5-year period. If these trees do not succumb to the grading activities, than no additional mitigation is necessary. However, if they should exhibit stress from these construction activities within this 5-year period, then these trees should be replaced using the replacement ratios outlined below. The project applicant, could also choose for simplicity, not to monitor the health of these few trees and assume they will be "lost" due to project activities. These trees would then be replaced with the ratios discussed below.

(2) Where avoidance of riparian habitat is not possible, then areas impacted by project implementation should be replaced, on-site, with newly created Valley Oak/Sycamore Riparian Woodland. A Riparian Restoration Plan should be developed by a qualified biologist which contains the following components:

(a) Location of appropriate restoration sites. On-site restoration locations should be designated, which are complete with an analysis of the technical feasibility to create riparian habitats of the kinds to be lost from project development at the required ratio. There appear to be sufficient areas on site to accommodate the tree and acreage replacement ratios. The largest potential mitigation site is located on an open stretch of the large creek in the vicinity of holes 2 and 6. Smaller potential sites occur adjacent to holes 8 and 9 near locations where vegetation is to be removed, and in between hole 9.

(b) Replacement ratio for lost trees. Replacement of lost trees at a 3:1 ratio for trees between 2-12" DBH and 5:1 ratio for trees greater than 12" DBH. These ratios should be necessary to compensate for the habitat values lost while restored riparian habitats are maturing (a process taking many years). It is preferable that planting be conducted from November to January using small nursery stock such as deep pots (2.5" x 10") for all trees. The replacement trees should be installed in an environment suitable for their establishment and growth. These trees should be irrigated and maintained for a period of not less than three years. The spacing of these trees should allow development of a full mature canopy. The mitigation site should be protected from future development or disturbance.

(c) Replacement ratio of lost acreage. Lost acreage should be replaced on a 3:1 basis with riparian habitat of equal or greater value.

(d) Apply for and comply with all appropriate permits. The project proponent should apply for, if appropriate, and obtain a Streambed Alteration Agreement from CDFG and a Section 404 permit from the USACE prior to issuance of a grading permit. The project proponent should comply with all conditions of each permit.

(3) Establish an undeveloped buffer on either side of the riparian area. The CDFG generally recommends riparian setbacks of 100 feet, and the Santa Clara County General Plan recommends setbacks of 150 feet from the top of the bank line where a creek is predominantly in its natural state (not converted to a concrete or rip-rap channel). However, because quality of the riparian habitat on site has been degraded due, presumably to many years of livestock grazing, smaller buffers should adequately protect existing riparian functions and values. The riparian woodland consists primarily of large, relatively widely-spaced trees. Little or no woody understory vegetation is present, and almost no regeneration of trees has occurred. The relatively simple and open structure of the riparian habitat has resulted in a reduction of its value to wildlife. Wildlife habitat value and the preservation of existing vegetation conditions may, therefore, be maintained with reduced buffers.

On the main channel of the site, a minimum buffer of 50 feet on either side of all riparian trees as measured from the edge of the canopy should be established. In areas that do not support canopy for a sizable distance (at least 100 feet) the buffer should measure 10 feet from the top of bank. On all tributaries to the main channel, a minimum buffer of 25 feet on either side of all riparian trees as measured from the edge of canopy should be established; in areas not supporting riparian trees the buffer shall measure 10 feet. Structures, access roads, golf course fairways, cart paths, etc. should not be constructed within this buffer. Cart and pedestrian bridge crossings may be allowed.

Portions of several of the small tributaries will be filled, graded or culverted. These impacts are addressed under the Impacts to Aquatic Habitat and Emergent Vegetation section above. Mitigation for these areas, which are subject to regulation by both the USACE and CDFG will be addressed by another consultant in other parts of the EIR

(4) Discourage additional human intrusion into the riparian zone. Provide bridge crossings in all locations where creek crossing is necessary to travel from one hole to another or from one end of a hole to the other. Prohibit access into the riparian and buffer zone. Install signs and distribute information to golfers regarding the value of the riparian habitat of the site and the prohibitions of access into it. Periodically, golf balls and other man-made debris should be carefully removed from the riparian area by trained maintenance personnel.

Disturbance to Burrowing Owl Nests from Construction Activities During Project Implementation. Pre-construction surveys should be conducted to ensure that breeding Burrowing Owls are not disturbed by any construction-related activities. If fully implemented, this measure is expected to reduce the potential project-related environmental effects on Burrowing Owls to a less-than-significant level.

(1) Construction activities should be preceded by pre-construction surveys for Burrowing Owls by a qualified ornithologist. If no owls are located during these surveys, then no additional action is warranted. However, if breeding owls are located on or adjacent to the site, then an ornithologist will determine the extent of a construction-free buffer zone around the active nesting Burrowing Owl. No construction activities should proceed which would disturb breeding owls. The CDFG should also be immediately contacted to determine if any additional mitigation measures are necessary.

(2) Burrowing Owls discovered using the site during the non-breeding season may be passively relocated by installing one-way doors in active burrows. These doors should remain in the burrows for up to four days to ensure that no owls remain underground. All active burrows should then be carefully excavated to ensure that no owls

remain underground. All burrows in the construction area should be closed prior to the passive relocation to prevent owls from using them.

Disturbance to Active Raptor Nests from Construction Activities During Project Implementation. The mitigation measure described below should be implemented by the project proponent to reduce the adverse environmental effects of the proposed project on any raptors nesting within the project site or immediately adjacent to the site. If fully implemented, this measure is expected to reduce the potential project-related environmental effects on nesting raptors to a less-than-significant level.

Construction activities during the nesting season (February to July) will be preceded by preconstruction surveys for nesting raptors by a qualified ornithologist. No construction activities, including tree removal, which would result in disturbance to active raptor nests, should proceed. The ornithologist will determine the extent of construction-free zones around active raptor nests located during surveys. The USFWS and CDFG should also be notified of any active raptor nest within the construction zone.

Loss of Seasonal Wetlands, Aquatic Habitats, and Emergent Vegetation

Mitigation for losses of all Waters of the U.S. will be presented by others in the EIR.

Introduction of Non-Native Species

Landscaping may result in the introduction of additional exotic plants to the project site which are capable of naturalizing in native habitats and reducing the diversity of native plants on the site. Implementation of the following measure will reduce this impact to a level of insignificance.

A qualified botanist or horticulturist shall prepare a list of all exotic plants known to readily naturalize in habitats similar to those found on the project site. Species such as black locust, blue gum, various brooms, periwinkle, and others known to be invasive and difficult to eradicate will be placed on this list and not used in residential landscaping for the Hayes Valley project.

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Appendix A. Vascular plants observed on the Hayes Valley project site.

FAMILY NAME	SCIENTIFIC NAME	COMMON NAME
Anacardiaceae	*Toxicodendron diversilobum*	poison oak
Apiaceae	*Conium maculatum*	poison hemlock
	Lomatium macrocarpum	large-fruited lomatium
	Sanicula bipinnatifida	purple sanicle
Apocynaceae	*Vinca major*	periwinkle
Asteraceae	*Achillea millefolium*	common yarrow
	Achyrachaena mollis	blow-wives
	Agoseris grandiflora	California dandelion
	Artemisia californica	California sagebrush
	Artemisia douglasiana	California mugwort
	Baccharis pilularis	coyote brush
	Baccharis salicifolia	mulefat
	Calycadenia multiglandulosa	sticky calycadenia
	Carduus pycnocephalus	Italian thistle
	Centaurea calcitrapa	pink star thisle
	Centauria solstitialis	yellow star thistle
	Chamomilla sauveolens	pineapple weed
	Filago gallica	narrow-leaved fillago
	Lactuca serriola	prickly lettuce
	Lasthenia californica	goldfields
	Lasthenia glaberrima	smooth lasthenia
	Layia platyglossa	tidy tips
	Micropus californicus	slender cottonweed
	Picris echioides	bristly ox-tongue
	Senecio vulgaris	common groundsel
	Silybum marianum	milk thistle
	Sonchus oleraceus	common sow-thistle
	Wyethia helenioides	gray mule's ear
Boraginaceae	*Amsinkia menziesii var. intermedia*	fiddleneck
	Plagiobothrys bracteatus	bracted popcornflower
	Plagiobothrys sp.	popcornflower
Brassicaceae	*Brassica nigra*	black mustard
	Capsella bursa-pastoris	shepherd's purse
	Hirschfeldia incana	smallpod mustard
	Lepidium nitidum	shining peppergrass
	Raphanus sativus	wild radish
	Rorippia nasturtium-aquaticum	watercress
	Streptanthus albidus ssp. paramoenu	uncommon jewelflower
	Thelypodium lasiophyllum	California mustard
Callitricaceae	*Callitriche sp.*	water-starwort
Campanulaceae	*Downingia concolor*	maroon-spotted downingia
Caprifoliaceae	*Sambucus mexicana*	blue elderberry
	Symphoricarpos rivularis	snowberry

Appendix A continued.

FAMILY NAME	SCIENTIFIC NAME	COMMON NAME
Caryophyllaceae	*Cerastium arvense*	mouse-ear chickweed
	Silene gallica	catchfly
	Stellaria media	common chickweed
Chenopodiaceae	*Chenopodium album*	lamb's quarters
Convolvulaceae	*Convolvulus arvensis*	field bindweed
Crassulaceae	*Crassula connata*	pygmy weed
	Dudleya setchellii	Santa Clara Valley dudleya
Cucurbitatceae	*Marah fabaceus*	wild cucumber
Cyperaceae	*Cyperus eragrostis*	tall umbrella plant
	Cyperus sp.	sedge
	Eleocharis macrostachya	spike-rush
Dennstaedtiaceae	*Pteridium aquilinum*	bracken fern
Ericaceae	*Arctostaphylos glauca*	bigberry manzanita
Euphorbiaceae	*Chamaesyce serpyllifolia*	thyme-leaved spurge
	Eremocarpus setigerus	dove weed
	Euphorbia spathulata	reticulate spurge
Fabaceae	*Cytisus monspessulanus*	French broom
	Lotus scoparius	deer weed
	Lotus wrangelianus	Chile trefoil
	Lupinus albifrons var. albifrons	silver bush lupine
	Lupinus bicolor	annual lupine
	Lupinus densiflorus	yellow annual lupine
	Lupinus succulentus	succulent annual lupine
	Medicago polymorpha	burr clover
	Melilotus alba	white sweet-clover
	Melilotus indica	sourclover
	Trifolium hirtum	rose clover
	Trifolium willdenovii	tomcat clover
	Vicia americana	American vetch
	Vicia banghalensis	common vetch
	Quercus agrifolia	coast live oak
	Quercus douglasii	blue oak
	Quercus kellogii	black oak
	Quercus lobata	valley oak
Geraniaceae	*Erodium botrys*	wide-leaf filaree
	Erodium cicutarium	red-stem filaree
	Geranium dissectum	cut-leaved geranium
	Geranium molle	soft geranium
Grossulariaceae	*Ribes californica*	California current
	Ribes sp.	current
Hippocastanaceae	*Aesculus californica*	California buckeye
Iridaceae	*Sisyrinchium bellum*	blue-eyed grass
Juglandaceae	*Juglans californica var. hindsii*	California black walnut
Juncaceae	*Juncus balticus*	Baltic rush
	Juncus bufonius	toad rush
	Juncus xiphiodes	iris-leaved rush
Juncaginaceae	*Lilaea scilloides*	flowering quillwort
Lamiaceae	*Lamium aplexicaule*	dead nettle

Appendix A continued.

FAMILY NAME	SCIENTIFIC NAME	COMMON NAME
Lamiaceae (continued)	*Marrubium vulgare*	horehound mint
	Salvia columbariae	chia
	Salvia mellifera	black sage
	Stachys sp.	hedge-nettle
Lemnaceae	*Lemna sp.*	duckweed
Liliaceae	*Allium dichlamydeum*	coastal onion
	Calochortus venustus	white mariposa tulip
	Chlorogalum pomeridianum	soap plant
	Dichelostemma capitatum	blue dicks
	Muilla maritima	common muilla
	Triteleia hyacinthina	white brodiaea
	Triteleia laxa	Ithuriel's spear
Limnanthaceae	*Limnanthes douglasii ssp. nivea*	snow white meadowfoam
Loranthaceae	*Phoradendron flavescens*	common mistletoe
Lythraceae	*Lythrum hyssopifolia*	hyssop loosestrife
Malvaceae	*Malva nicaeensis*	bull mallow
	Malva parviflora	cheese weed
Myrtaceae	*Eucalyptus globulus*	blue gum eucalyptus
Onagraceae	*Clarkia unguiculata*	elegant clarkia
	Epilobium californicum	California willow herb
Papaveraceae	*Eschscholzia californica*	California poppy
	Platystemon californicum	cream cups
Plantaginaceae	*Plantago erecta*	California plantain
	Plantago lanceolata	English plantain
Plantanaceae	*Platanus racemosa*	California sycamore
Poaceae	*Aira caryophyllea*	silvery hairgrass
	Avena fatua	wild oats
	Briza minor	small rattlesnake grass
	Bromus carinatus var.carinatus	California brome
	Bromus diandrus	ripgut grass
	Bromus hordeaceus	soft chess
	Bromus madritensis ssp. rubens	foxtail chess
	Bromus tectorum	cheat grass
	Cynodon dactylon	Bermuda grass
	Elymus glaucus	glaucus wild rye
	Elymus multisetus	squirreltail
	Hordeum marinum ssp. gussoneanu	Mediterranean barley
	Hordeum murinum ssp. leproinum	farmer's foxtail
	Hordeum vulgare	common barley
	Lamarkia aurea	epaulette grass
	Lolium multiflorum	Italian ryegrass
	Melica sp.	melic grass
	Nassella pulchra	purple needlegrass
	Phalaris paradoxa	paradox canary grass
	Piptatherum millaceum	smilo grass
	Poa annua	annual bluegrass
	Poa secunda ssp. secunda	one-sided bluegrass
	Polypogon monspeliensis	rabbitfoot grass
	Vulpia sp.	fescue

Appendix A continued.

FAMILY NAME	SCIENTIFIC NAME	COMMON NAME
Polemoniaceae	*Gilia achilleifolia*	California gilia
	Gilia tricolor	Bird's eye gilia
	Linanthus ambiguous	serpentine linanthus
	Linanthus dichotomus	evening snow
	Linanthus liniflorus	flax-flowered linanthus
Polygonaceae	*Eriogonum nudum*	nude buckwheat
	Eriogonum sp.	buckwheat
	Polygonum arenastrum	prostrate knotweed
	Pterostegia drymarioides	pterostegia
	Rumex acetosella	sheep sorrel
	Rumex crispus	curly dock
	Rumex pulcher	fiddle dock
Polypodiaceae	*Polypodium californicum*	California polypody
Portulaceae	*Calandrinia ciliata*	red maids
	Claytonia perfoliata	miner's lettuce
Primulaceae	Anagallis arvensis	scarlet pimpernel
	Dodecatheon clevelandii	shooting star
Pteridaceae	*Adiantum jordanii*	Jordan's maidenhair fern
	Pellea andromedifolia	coffee fern
	Pentagramma triangularis	goldback fern
Ranunculaceae	*Delphinium hesperium*	western larkspur
Ranunculaceae	*Ranunculus californicus*	California buttercup
	Rhamnus californica	coffeeberry
Rosaceae	*Heteromeles arbutifolia*	toyon
	Prunus sp.	plum
	Rosa californica	California rose
Rubiaceae	*Galium aparine*	bedstraw
	Galium sp.	bedstraw
Salicaceae	*Salix laevagata*	red willow
	Salix lasiolepis	arroyo willow
Saxifragaceae	*Ribes sp.*	gooseberry
Scrophulariaceae	*Antirrhinum vexillo-calyculatum*	wiry snapdragon
Scrophulariaceae	*Castelleja densiflora*	owl's clover
	Mimulus guttatus	common monkeyflower
	Veronica persica	Persian speedwell
	Castilleja exerta	purple owls clover
-	Scrophularia californica	California bee plant
Solanaceae	Solanum sp.	nightshade

The species are arranged alphabetically by family name for all vascular plants encountered during the plant survey. Plants are also listed alphabetically within each family. In some cases it was not possible to accurately identify a particular plant to the species level due to the absence of specific anatomic structures required for identification.

APPENDIX B

VERTEBRATE SPECIES WHICH MAY OCCUR ON THE HAYES VALLEY SITE

CLASS: AMPHIBIA

ORDER: CAUDATA (Salamanders)
FAMILY: AMBYSTOMATIDAE (Mole Salamanders and Relatives)
California Tiger Salamander, (*Ambystoma californiense*)
FAMILY: SALAMANDRIDAE (Newts)
California Newt, (*Taricha torosa*)
FAMILY: PLETHODONTIDAE (Lungless Salamanders)
Ensatina, (*Ensatina eschscholtzi*)
Black Salamander, (*Aneides flavipunctatus*)
Arboreal Salamander, (*Aneides lugubris*)
California Slender Salamander, (*Batrachoseps attenuatus*)

ORDER: SALIENTIA (Frogs and Toads)
FAMILY: BUFONIDAE (True Toads)
California Toad, (*Bufo boreas halophilus*)
FAMILY: HYLIDAE (Treefrogs and Relatives)
Pacific Treefrog, (*Pseudacris regilla*)
FAMILY: RANIDAE (True Frogs)
California Red-legged Frog, (*Rana aurora draytoni*)

CLASS: REPTILIA

ORDER: TESTUDINATA(Turtles)
FAMILY: EMYDIDAE (Pond and Marsh Turtles)
Western Pond Turtle, (*Clemmys marmorata*)

ORDER: SQUAMATA (Lizards and Snakes)

SUBORDER: SAURIA (Lizards)
FAMILY: IGUANIDAE (Iguanids)
Western Fence Lizard, (*Sceloporus occidentalis*)
California Horned Lizard (*Phrynosoma coronatum frontale)*
FAMILY: SCINCIDAE (Skinks)
Western Skink, (*Eumeces skiltonianus*)
FAMILY: ANGUIDAE (Alligator Lizards and Relatives)
Southern Alligator Lizard, (*Gerrhonotus multicarinatus*)
FAMILY: ANNIELLIDAE (California Legless Lizards)
California Legless Lizard, (*Anniella pulchra*)

SUBORDER: SERPENTES (Snakes)
FAMILY: COLUBRIDAE (Colubrids)
Ringneck Snake, (*Diadophis punctatus*)
Sharp-tailed Snake, (*Contia tenuis*)
Striped Racer, (*Masticophis lateralis*)
Gopher Snake, (*Pituophis melanoleucus*)

Common Kingsnake, (*Lampropeltis getulus*)
Common Garter Snake, (*Thamnophis sirtalis*)
Western Terrestrial Garter Snake, (*Thamnophis elegans*)
Western Aquatic Garter Snake, (*Thamnophis atratus*)
FAMILY: VIPERIDAE (Vipers)
Western Rattlesnake, *(Crotalus viridis)*

CLASS: AVES

ORDER PODICIPEDIFORMES (Grebes)
FAMILY: PODICIPEDIDAE (Grebes)
Pied-billed Grebe, (*Podilymbus podiceps*)
Eared Grebe, (*Podiceps nigricollis*)
Western Grebe, (*Aechmophorus occidentalis*)
Clark's Grebe, (*Aechmophorus clarkii*)

ORDER PROCELLARIIFORMES (Albatrosses, Shearwaters, Petrels, and Relatives)
FAMILY: PELECANIDAE (Pelicans)
American White Pelican, (*Pelecanus erythrorhynchos*)
FAMILY: PHALACROCORACIDAE (Cormorants)
Double-crested Cormorant, (*Phalacrocorax auritis*)

ORDER: CICONIIFORMES (Herons, Storks, Ibises, and Relatives)
FAMILY: ARDEIDAE (Herons and Bitterns)
Great Blue Heron, (*Ardea herodias*)
Great Egret, (*Casmerodius albus*)
Snowy Egret, (*Egretta thula*)
Green-backed Heron, (*Butorides striatus*)
Black-crowned Night Heron, (*Nycticorax nycticorax*)

ORDER: ANSERIFORMES (Screamers, Ducks, and Relatives)
FAMILY: ANATIDAE (Swans, Geese, and Ducks)
Canada Goose, (*Branta canadensis*)
Wood Duck, (*Aix sponsa*)
Green-winged Teal, (*Anas crecca*)
Mallard, (*Anas platyrhynchos*)
Northern Pintail, (*Anas acuta*)
Cinnamon Teal, (*Anas cyanoptera*)
Northern Shoveler, (*Anas clypeata*)
Gadwall, (*Anas strepera*)
American Wigeon, (*Anas americana*)
Canvasback, (*Aythya valisineria*)
Redhead, (*Aythya americana*)
Ring-necked Duck, (*Aythya collaris*)
Common Goldeneye, (*Bucephala clangula*)
Hooded Merganser, (*Lophodytes cucullatus*)
Common Merganser, (*Mergus merganser*)
Ruddy Duck, (*Oxyura jamaicensis*)

ORDER: FALCONIFORMES (Vultures, Hawks, and Falcons)
FAMILY: CATHARTIDAE (American Vultures)
Turkey Vulture, (*Cathartes aura*)
FAMILY: ACCIPITRIDAE (Hawks, Old World Vultures, and Harriers)

White-tailed Kite, (*Elanus caeruleus*)
Bald Eagle, (*Haliaeetus leucocephalus*)
Northern Harrier, (*Circus cyaneus*)
Sharp-shinned Hawk, (*Accipiter striatus*)
Cooper's Hawk, (*Accipiter cooperii*)
Red-shouldered Hawk, (*Buteo lineatus*)
Red-tailed Hawk, (*Buteo jamaicensis*)
Ferruginous Hawk, (*Buteo regalis*)
Rough-legged Hawk, (*Buteo lagopus*)
Golden Eagle, (*Aquila chrysaetos*)
FAMILY: FALCONIDAE (Caracaras and Falcons)
American Kestrel, (*Falco sparverius*)
Merlin, (*Falco columbarius*)
Prairie Falcon, (*Falco mexicanus*)

ORDER: GALLIFORMES (Megapodes, Currassows, Pheasants, and Relatives)
FAMILY: PHASIANIDAE (Quails, Pheasants, and Relatives)
Ring-necked Pheasant, (*Phasianus colchicus*)
Wild Turkey, (*Meleagris gallopavo*)
California Quail, (*Callipepla californica*)

ORDER: GRUIFORMES (Cranes, Rails, and Relatives)
FAMILY: RALLIDAE (Rails, Gallinules, and Coots)
Virginia Rail, (*Rallus limicola*)
Sora, (*Porzana carolina*)
Common Moorhen, (*Gallinula chloropus*)
American Coot, (*Fulica americana*)

ORDER: CHARADRIIFORMES (Shorebirds, Gulls, and Relatives)
FAMILY: CHARADRIIDAE (Plovers and Relatives)
Black-bellied Plover, (*Pluvialis squatarola*)
Semipalmated Plover, (*Charadrius semipalmatus*)
Killdeer, (*Charadrius vociferus*)
FAMILY: SCOLOPACIDAE (Sandpipers and Relatives)
Greater Yellowlegs, (*Tringa melanoleuca*)
Lesser Yellowlegs, (*Tringa flavipes*)
Spotted Sandpiper, (*Actitis macularia*)
Long-billed Curlew, (*Numenius americanus*)
Western Sandpiper, (*Calidris mauri*)
Least Sandpiper, (*Calidris minutilla*)
Long-billed Dowitcher, (*Limnodromus scolopaceus*)
Common Snipe, (*Gallinago gallinago*)
FAMILY: LARIDAE (Gulls and Terns)
Ring-billed Gull, (*Larus delawarensis*)
California Gull, (*Larus californicus*)

ORDER: COLUMBIFORMES (Pigeons and Doves)
FAMILY: COLUMBIDAE (Pigeons and Doves)
Rock Dove, (*Columba livia*)
Band-tailed Pigeon, (*Columba fasciata*)
Mourning Dove, (*Zenaida macroura*)

ORDER: STRIGIFORMES (Owls)
FAMILY: TYTONIDAE (Barn Owls)
Common Barn Owl, (*Tyto alba*)
FAMILY: STRIGIDAE (Typical Owls)
Western Screech Owl, (*Otus kennicottii*)
Great Horned Owl, (*Bubo virginianus*)
Burrowing Owl, (*Speotyto cunicularia*)

ORDER: CAPRIMULGIFORMES (Goatsuckers and Relatives)
FAMILY: CAPRIMULGIDAE (Goatsuckers)
Common Poor-will, (*Phalaenoptilus nuttallii*)

ORDER: APODIFORMES (Swifts and Hummingbirds)
FAMILY: APODIDAE (Swifts)
Vaux's Swift, (*Chaetura vauxi*)
White-throated Swift, (*Aeronautes saxatalis*)
FAMILY: TROCHILIDAE (Hummingbirds)
Anna's Hummingbird, (*Calypte anna*)
Rufous Hummingbird, (*Selasphorus rufus*)
Allen's Hummingbird, (*Selasphorus sasin*)

ORDER: CORACIIFORMES (Kingfishers and Relatives)
FAMILY: ALCEDINIDAE (Kingfishers)
Belted Kingfisher, (*Ceryle alcyon*)

ORDER: PICIFORMES (Woodpeckers and Relatives)
FAMILY: PICIDAE (Woodpeckers and Wrynecks)
Lewis' Woodpecker, (*Melanerpes lewis*)
Acorn Woodpecker, (*Melanerpes formicivorus*)
Red-breasted Sapsucker, (*Sphyrapicus ruber*)
Nuttall's Woodpecker, (*Picoides nuttallii*)
Downy Woodpecker, (*Picoides pubescens*)
Hairy Woodpecker, (*Picoides villosus*)
Northern Flicker, (*Colaptes auratus*)

ORDER: PASSERIFORMES (Perching Birds)
FAMILY: TYRANNIDAE (Tyrant Flycatchers)
Olive-sided Flycatcher, (*Contopus borealis*)
Western Wood-Pewee, (*Contopus sordidulus*)
Willow Flycatcher, (*Empidonax traillii*)
Hammond's Flycatcher, (*Empidonax hammondii*)
Dusky Flycatcher, (*Empidonax oberholseri*)
Pacific-slope Flycatcher, (*Empidonax difficilis*)
Black Phoebe, (*Sayornis nigricans*)
Say's Phoebe, (*Sayornis saya*)
Ash-throated Flycatcher, (*Myiarchus cinerascens*)
Western Kingbird, (*Tyrannus verticalis*)
FAMILY: ALAUDIDAE (Larks)
Horned Lark, (*Eremophila alpestris*)
FAMILY: HIRUNDINIDAE (Swallows)
Tree Swallow, (*Tachycineta bicolor*)
Violet-green Swallow, (*Tachycineta thalassina*)
Northern Rough-winged Swallow, (*Stelgidopteryx serripennis*)
Cliff Swallow, (*Hirundo pyrrhonota*)

Barn Swallow, (*Hirundo rustica*)
FAMILY: CORVIDAE (Jays, Magpies, and Crows)
Steller's Jay, (*Cyanocitta stelleri*)
Scrub Jay, (*Aphelocoma coerulescens*)
Yellow-billed Magpie, (*Pica nuttalli*)
American Crow, (*Corvus brachyrhynchos*)
Common Raven, (*Corvus corax*)
FAMILY: PARIDAE (Titmice)
Chestnut-backed Chickadee, (*Parus rufescens*)
Plain Titmouse, (*Parus inornatus*)
FAMILY: AEGITHALIDAE (Bushtit)
Bushtit, (*Psaltriparus minimus*)
FAMILY: SITTIDAE (Nuthatches)
White-breasted Nuthatch, (*Sitta carolinensis*)
FAMILY: CERTHIIDAE (Creepers)
Brown Creeper, (*Certhia americana*)
FAMILY: TROGLODYTIDAE (Wrens)
Rock Wren, (*Salpinctes obsoletus*)
Bewick's Wren, (*Thryomanes bewickii*)
House Wren, (*Troglodytes aedon*)
Marsh Wren, (*Cistothorus palustris*)
FAMILY: MUSCICAPIDAE (Old World Warblers, Gnatcatchers, Kinglets, Thrushes, Bluebirds, and Wrentit)
Golden-crowned Kinglet, (*Regulus satrapa*)
Ruby-crowned Kinglet, (*Regulus calendula*)
Blue-gray Gnatcatcher, (*Polioptila caerulea*)
Western Bluebird, (*Sialia mexicana*)
Mountain Bluebird, (*Sialia currucoides*)
Swainson's Thrush, (*Catharus ustulatus*)
Hermit Thrush, (*Catharus guttatus*)
American Robin, (*Turdus migratorius*)
Varied Thrush, (*Ixoreus naevius*)
Wrentit, (*Chamaea fasciata*)
FAMILY: MIMIDAE (Mockingbirds and Thrashers)
Northern Mockingbird, (*Mimus polyglottos*)
Sage Thrasher, (*Oreoscoptes montanus*)
California Thrasher, (*Toxostoma redivivum*)
FAMILY: MOTACILLIDAE (Wagtails and Pipits)
American Pipit, (*Anthus rubescens*)
FAMILY: BOMBYCILLIDAE (Waxwings)
Cedar Waxwing, (*Bombycilla cedrorum*)
FAMILY: PTILOGONATIDAE (Silky Flycatchers)
Phainopepla, (*Phainopepla nitens*)

FAMILY: LANIIDAE (Shrikes)
Loggerhead Shrike, (*Lanius ludovicianus*)
FAMILY: STURNIDAE (Starlings)
European Starling, (*Sturnus vulgaris*)
FAMILY: VIREONIDAE (Typical Vireos)
Solitary Vireo, (*Vireo solitarius*)
Hutton's Vireo, (*Vireo huttoni*)
Warbling Vireo, (*Vireo gilvus*)
FAMILY: EMBERIZIDAE (Wood Warblers, Sparrows, Blackbirds, and Relatives)

Orange-crowned Warbler, (*Vermivora celata*)
Nashville Warbler, (*Vermivora ruficapilla*)
Yellow Warbler, (*Dendroica petechia brewsteri*)
Yellow-rumped Warbler, (*Dendroica coronata*)
Black-throated Gray Warbler, (*Dendroica nigrescens*)
Townsend's Warbler, (*Dendroica townsendi*)
Hermit Warbler, (*Dendroica occidentalis*)
MacGillivray's Warbler, (*Oporornis tolmiei*)
Common Yellowthroat, (*Geothlypis trichas*)
Wilson's Warbler, (*Wilsonia pusilla*)
Western Tanager, (*Piranga ludoviciana*)
Black-headed Grosbeak, (*Pheucticus melanocephalus*)
Lazuli Bunting, (*Passerina amoena*)
Rufous-sided Towhee, (*Pipilo erythrophthalmus*)
California Towhee, (*Pipilo crissalis*)
Rufous-crowned Sparrow, (*Aimophila ruficeps*)
Chipping Sparrow, (*Spizella passerina*)
Lark Sparrow, (*Chondestes grammacus*)
Savannah Sparrow, (*Passerculus sandwichensis*)
Fox Sparrow, (*Passerella iliaca*)
Song Sparrow, (*Melospiza melodia*)
Lincoln's Sparrow (*Melospiza lincolnii*)
Golden-crowned Sparrow, (*Zonotrichia atricapilla*)
White-crowned Sparrow, (*Zonotrichia leucophrys*)
Dark-eyed Junco, (*Junco hyemalis*)
Red-winged Blackbird, (*Agelaius phoeniceus*)
Tricolored Blackbird, (*Agelaius tricolor*)
Western Meadowlark, (*Sturnella neglecta*)
Brewer's Blackbird, (*Euphagus cyanocephalus*)
Brown-headed Cowbird, (*Molothrus ater*)
Hooded Oriole, (*Icterus cucullatus*)
Northern Oriole, (*Icterus galbula*)
FAMILY: FRINGILLIDAE (Finches)
Purple Finch, (*Carpodacus purpureus*)
House Finch, (*Carpodacus mexicanus*)
Pine Siskin, (*Carduelis pinus*)
Lesser Goldfinch, (*Carduelis psaltria*)
Lawrence's Goldfinch, (*Carduelis lawrencei*)
American Goldfinch, (*Carduelis tristis*)
FAMILY: PASSERIDAE (Weaver Finches)
House Sparrow, (*Passer domesticus*)

CLASS: MAMMALIA

ORDER: MARSUPIALIA (Opossums, Kangaroos, and Relatives)
FAMILY: DIDELPHIDAE (Opossums)
Virginia Opossum, (*Didelphis virginiana*)

ORDER: INSECTIVORA (Shrews and Moles)
FAMILY: SORICIDAE (Shrews)
Ornate Shrew, (*Sorex ornatus*)
FAMILY: TALPIDAE (Moles)
Broad-footed Mole, (*Scapanus latimanus*)

ORDER: CHIROPTERA (Bats)
FAMILY: VESPERTILIONIDAE (Vespertilionid Bats)
Yuma Myotis, (*Myotis yumanensis*)
Long-eared Myotis, (*Myotis evotis*)
Fringed Myotis, (*Myotis thysanodes*)
Long-legged Myotis, (*Myotis volans*)
California Myotis, (*Myotis californicus*)
Western Pipistrelle, (*Pipistrellus hesperus*)
Big Brown Bat, (*Eptesicus fuscus*)
Western Red Bat, (*Lasiurus borealis*)
Hoary Bat, (*Lasiurus cinereus*)
Townsend's Big-eared Bat, (*Plecotus townsendii*)
Pallid Bat, (*Antrozous pallidus*)
FAMILY: MOLOSSIDAE (Free-tailed Bat)
Brazilian Free-tailed Bat, (*Tadarida brasiliensis*)
Western Mastiff Bat, (*Eumops perotis*)

ORDER: LAGOMORPHA (Rabbits, Hares, and Pikas)
FAMILY: LEPORIDAE (Rabbits and Hares)
Brush Rabbit, (*Sylvilagus bachmani*)
Desert Cottontail, (*Sylvilagus audubonii*)
Black-tailed Hare, (*Lepus californicus*)

ORDER: RODENTIA (Squirrels, Rats, Mice, and Relatives)
FAMILY: SCIURIDAE (Squirrels, Chipmunks, and Marmots)
California Ground Squirrel, (*Spermophilus beecheyi*)
Western Gray Squirrel, (*Sciurus griseus*)
FAMILY: GEOMYIDAE (Pocket Gophers)
Botta's Pocket Gopher, (*Thomomys bottae*)
FAMILY: HETEROMYIDAE (Pocket Mice and Kangaroo Rats)
California Pocket Mouse, (*Perognathus californicus*)
Heermann's Kangaroo Rat, (*Dipodomys heermanni*)
FAMILY: CRICETIDAE (Deer Mice, Voles, and Relatives)
Western Harvest Mouse, (*Reithrodontomys megalotis*)
California Mouse, (*Peromyscus californicus*)
Deer Mouse, (*Peromyscus maniculatus*)
Pinyon Mouse, (*Peromyscus truei*)
Dusky-footed Woodrat, (*Neotoma fuscipes*)
California Vole, (*Microtus californicus*)
FAMILY: MURIDAE (Old World Rats and Mice)
Norway Rat, (*Rattus norvegicus*)
House Mouse, (*Mus musculus*)

ORDER: CARNIVORA (Carnivores)
FAMILY: CANIDAE (Foxes, Wolves, and Relatives)
Coyote, (*Canis latrans*)
Red Fox, (*Vulpes vulpes*)
Gray Fox, (*Urocyon cinereoargenteus*)
FAMILY: PROCYONIDAE (Raccoons and Relatives)
Ringtail, (*Bassariscus astutus*)
Raccoon, (*Procyon lotor*)
FAMILY: MUSTELIDAE (Weasels, Badgers, and Relatives)
Long-tailed Weasel, (*Mustela frenata*)
Badger, (*Taxidea taxus*)

Western Spotted Skunk, (*Spilogale gracilis*)
Striped Skunk, (*Mephitis mephitis*)
FAMILY: FELIDAE (Cats)
Puma, (*Felis concolor*)
Bobcat, (*Lynx rufus*)

ORDER: ARTIODACTYLA
FAMILY: SUIDAE (Pigs)
Wild Pig, (*Sus scrofa*)
FAMILY: CERVIDAE (Deer, Elk, and Relatives)
Black-tailed Deer, (*Odocoileus hemionus columbianus*)

H.T. HARVEY & ASSOCIATES
ECOLOGICAL CONSULTANTS

Hayes Valley
Golden Eagle Nest Survey
1989

Prepared by

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Attn: Bert Verrips

31 July, 1989 Job No. 385-05

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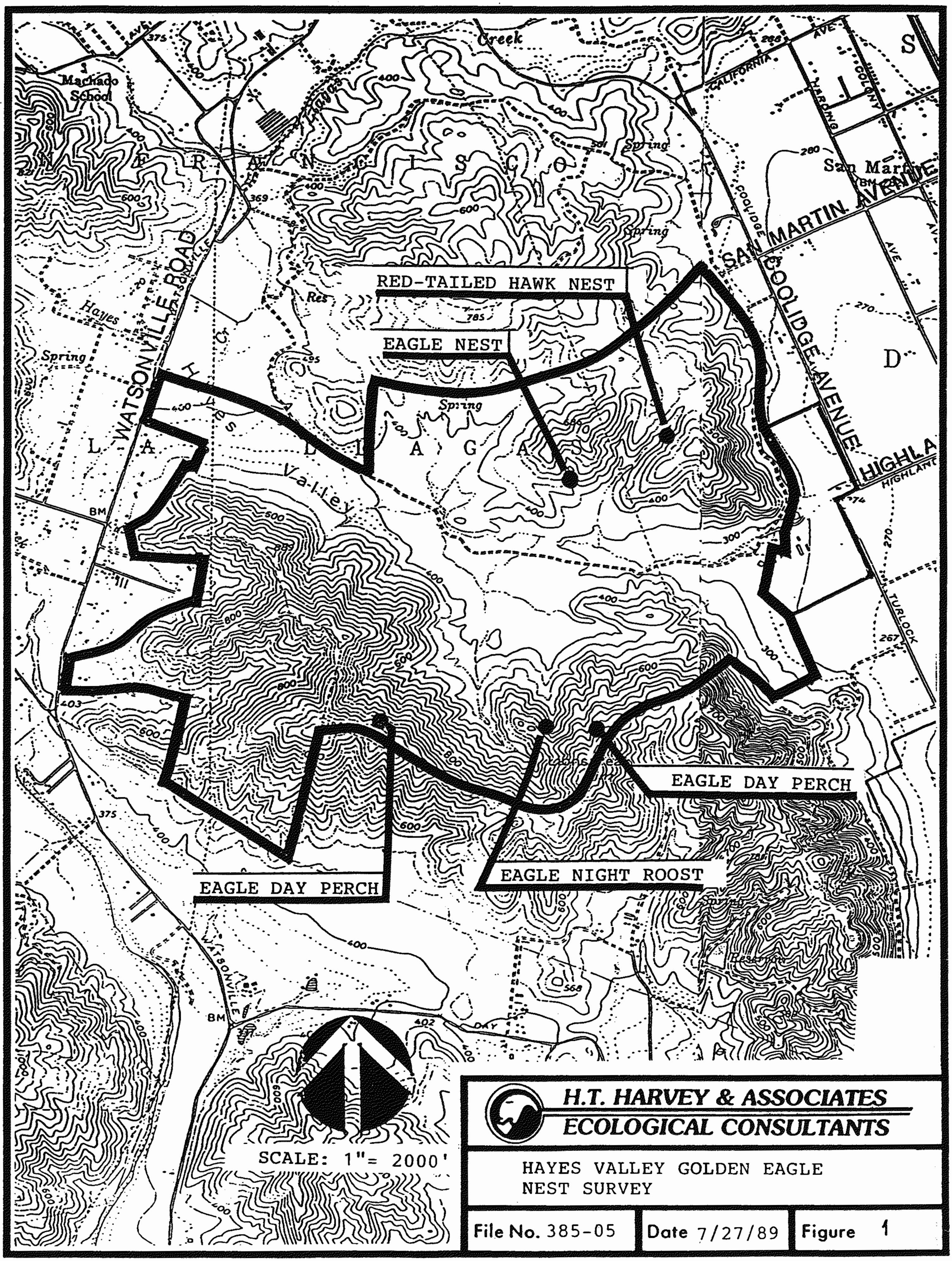
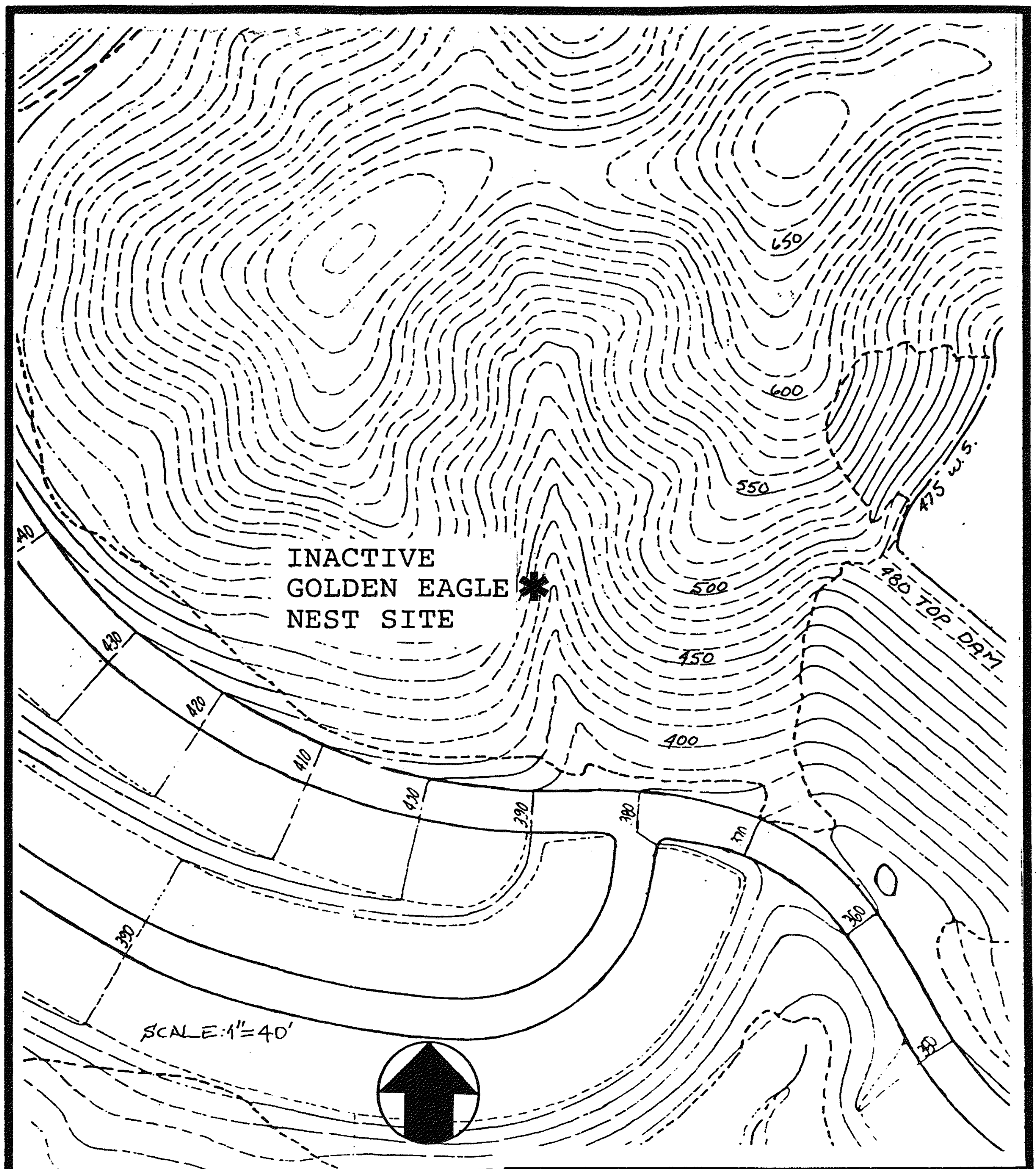
SUMMARY

Intensive ground searches of the wooded hillsides and tall trees on the floor of Hayes Valley were conducted from June 30 to July 13, 1989, to determine Golden Eagle (Aquila chrysaetos) activity. These field observations indicated that at least one pair of eagles is residing in the area represented in **Figures 1 and 2**. Several regular perches, a night roost, and an inactive nest were also discovered during this investigation. An active Red-tailed hawk (Buteo jamaicensis) nest was also found in the vicinity of the largest proposed reservoir.


RED-TAILED HAWK NEST
EAGLE NEST
EAGLE DAY PERCH
EAGLE NIGHT ROOST
EAGLE DAY PERCH
WATSONVILLE ROAD
SAN MARTIN AVENUE
COOLIDGE AVENUE
HIGHLAND
Machado School
Hayes Valley
Creek
Spring
SCALE: 1"= 2000'
H.T. HARVEY & ASSOCIATES
ECOLOGICAL CONSULTANTS
HAYES VALLEY GOLDEN EAGLE
NEST SURVEY
File No. 385-05
Date 7/27/89
Figure 1



H.T. HARVEY & ASSOCIATES
ECOLOGICAL CONSULTANTS

HAYES VALLEY GOLDEN EAGLE
NEST SURVEY

File No. 385-05	Date 7/27/89	Figure 2

INTRODUCTION

The Golden Eagle is one of the largest birds of prey in the world and in North America is second in size only to the Bald Eagle (Haliaeetus leucocephalus). In the United States, the greatest concentrations of Golden Eagles are found in the western states, particularly in mountain habitat and intermontane valleys (Snow 1974). Golden Eagles occupy definite territories, the size of which depends to a certain extent on availability of food, nest sites, and suitable terrain for soaring (Kalmback et al. 1964).

California offers a variety of biotic communities which provide the basic nesting requirements of Golden Eagles. These requirements are: 1) an available food source, 2) adequate nesting locations, and, 3) a degree of freedom from human intrusion (Thelander 1974).

Although the Golden Eagle shows a wide diversity in its food habits, it has a strong preference for small mammals, particularly rabbits and rodents, but will also take large to medium sized birds, reptiles and some carrion (Snow 1974, Carnie 1954). In California, a large percentage of its diet consists of California Ground Squirrel (Spermophilus beecheyi) and black-tailed Jackrabbit (Lepus californicus).

The Golden Eagle is capable of nesting on cliffs as well as in several species of trees, on man-made structures and on the ground (Wellein and Ray 1964). The nest structure consists of a collection of large branches fashioned to a bowl shape and decorated with fresh greens prior to and during the breeding season.

The nesting season for Golden Eagles ranges from late January to July, with peak activity from mid February to April. The most sensitive period of the cycle is during egg-laying and the initial incubation stage of the chicks. At this time eagles are most susceptible to disturbance and may abandon their nests. Incubation lasts from 43 to 45 days and the nestling period is usually 65 to 70 days (Beebe 1974). Young eagles may remain with the adults until the next breeding season.

LEGAL PROTECTION

Golden Eagles are federally protected under the Bald Eagle Protection Act (16 U.S.C. 668-668c), the Endangered Species Act and the Migratory Bird Treaty Act (16 U.S.C. 703-711). They are also protected statewide under regulations of the California Department of Fish and Game (Code 355 and 3511). Applications to the U.S. Fish and Wildlife Service are required for the collection or removal of eagles, their parts or nests.

METHODS

Observations of Golden Eagles in Hayes Valley during field surveys in spring, 1988, along with previous information on eagle nesting habitat selection, established the guidelines for areas surveyed. Additional sightings made during morning and evening periods led to the discovery of areas of high use. All wooded areas which were considered potential nesting areas were checked especially the north, east and west-facing slopes. Such situations are generally preferred nesting habitat. Most trees capable of supporting a nest structure were checked. In addition, all of the trees in the valley floor were inspected for eagle nests.

RESULTS

One Golden Eagle nest was discovered on the north side of the valley floor (Figures 1 & 2) in a coast live oak (Quercus agrifolia). Observations of this nest suggested recent use of the nest and nest tree. Numerous feathers and prey remains were found at the base of the tree and the ground was covered with eagle excrement. However, the nest structure had partially fallen. Eagles may have attempted to use the nest this season before its collapse but the nest was inactive at the time of this investigation. Due to its collapse it is incapable of supporting activities related to nesting unless rebuilt and would be considered an inactive nest. One eagle was observed perched in the nest tree on July 12, 1989.

Additionally, a night roost was found on the south side of the valley (Fig.1). One eagle was observed entering the roost at dusk on July 6. Extensive amounts of molted feathers, whitewash and prey remains found at this roost suggest that it has probably been used for several years.

No alternate eagle nest site was discovered during this survey but due to the difficulty in searching some of the areas, it is possible that at least one exists. Further surveys in early spring (February - April) would be necessary to confirm the presence of any alternate sites.

An active Red-tailed hawk nest was found at the bottom of a ravine on the north side of the valley floor from which one young had fledged (Fig. 1). This nest tree would potentially be flooded by a proposed reservoir.

DISCUSSION

Golden Eagles are present in and have attempted nesting in Hayes Valley in the past but were apparently not nesting this season. They may have attempted but were unsuccessful or abandoned their efforts this year in the early stages of their cycle. The one nest found during this survey had partially fallen and will not support the activities related to nesting unless rebuilt.

Due to the secretive habits of these birds and their infrequent visits to nest sites when not nesting, it was difficult to determine the existence of any alternate nests. Golden Eagles usually have a number of alternate nests, ranging from one to fourteen. Some pairs may use alternate nests in alternate years, other pairs never use alternate nests, even though they spend time repairing all of their nests (Snow, 1974).

Under existing conditions, there is potential for attempted nesting to continue in Hayes Valley in the future. Additionally, it is likely that eagles will continue to hunt in the area during and after construction of the development as long as the existing prey base is not eliminated. The frequency of use of Hayes Valley by the eagles will depend on the impact of the development on the prey populations. If the prey base is eliminated or severely reduced by the development or by the implementation of rodent control programs, the eagles will not hunt the area with the same frequency although they will probably continue to hunt the borders of the property where sufficient prey currently exists.

Eagles may attempt to nest on the north-facing slopes of Hayes Valley since this area offers numerous trees capable of supporting an eagle's nest. There appears to be a sufficient buffer between the border of the proposed development and the trees in this area to allow continued nesting attempts by the eagles unless they are purposefully disturbed by human activities during the critical period of their nesting cycle (February - April).

The Red-tailed hawk nest discovered during this survey will probably be abandoned due to changes in the surrounding habitat occurring during the construction of the reservoirs.

MITIGATION

Nest sites are perceived as the most crucial features of raptor habitat (Call 1979). It is also widely acknowledged that raptors can be very sensitive to disturbance during critical periods (egg-laying, incubation and the first week after hatching) of the nesting cycle (Fyfe and Olendorff 1976). The U.S. Fish and Wildlife Service, in cooperation with the California Department of Fish and Game, requires a mitigation plan for each nest site that will be impacted. Nests cannot be removed until the mitigation plan is approved.

According to the U.S. Fish and Wildlife Service Regulations (50-CFR-22.3 to 22.25), the eagle nest structure found in Hayes Valley would be considered an inactive nest and, therefore, could be "taken" with the proper permits. (S. Pruszenski, USFWS Enforcement Division, Pers. Comm.)

The definition of an "inactive nest" (Code of Fed. Reg. 50 CFR 22.3) is a nest that is not currently used by Golden Eagles as determined by the absence of any adult, egg, or dependent young at the nest during the ten days before the nest is taken. Although a nest is inactive, it still requires a permit for its removal from the U.S. Fish and Wildlife Service.

Loss of habitat is also a serious threat to the continued existence of Golden Eagles (Snow 1974). Construction that leads to moderate or substantial habitat loss and long-term human disturbance should be mitigated with permanent buffer zones. Buffers around critical areas (nests, roosts) provide isolation from facilities, human activity and altered habitat (Postovit et al. 1982).

RECOMMENDATIONS

Further surveys are recommended especially during the early stages of the breeding cycle (February - April) to locate active and alternate nests which may potentially affect land use plans.

Designate primary and secondary buffer zones to protect nests and night roosts from disturbance. The dimensions of these zones should be based on topography, foraging patterns, habitat use and prey availability. Several recommendations for the size of buffer zones around nests have been suggested for Bald Eagle nests in Washington and Oregon and can be used as guidelines for Golden Eagle nests.

A primary zone radius of 330 feet and a secondary zone radius of 660 feet from the nest has been set as a guideline for Bald Eagle nests and communal roosts (USFWS 1981).

The possible impact of development on raptor hunting areas is currently being studied. Initial results indicate that large tracts of monotypic habitat can be detrimental to prey species (Snow 1974). There is need to determine the potential effect on the existing prey base, of future development and its impact on the eagles.

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SPECIAL-STATUS SPECIES SURVEYS
HAYES VALLEY

By

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12 August 1992 File No.385-08

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SPECIAL-STATUS SPECIES SURVEYS
HAYES VALLEY

HERPETOLOGICAL SURVEYS

Methods

Herpetological surveys were conducted for special-status species including California Tiger Salamander (*Ambystoma californiense*), California Red-legged frog (*Rana aurora draytonii*) and Western pond turtle (*Clemmys marmorata*). These surveys were conducted on 29 April, 7 May and 2 June 1992. Special emphasis was given to three stock ponds on the site (Figure 1).

The site was surveyed on 29 April 1992 by Dr. Mark Jennings. Pond 1 was dipnetted, and the remainder of the site was examined on a reconnaissance basis.

Dr. Jennings and George Banuelos surveyed three ponds for California tiger salamander larvae on 7 May. They used a 10 ft. long minnow seine in ponds 1 and 3.

The site was visited on 2 June by Ronald Duke and Scott Terrill, along with Malcolm Sproul of LSA and Patricia Anderson of CDFG. Malcolm Sproul dipped a net into pond 2, and observations were made of the other ponds.

Results

Many California toad larvae (*Bufo boreas halophilus*), Pacific treefrogs (*Pseudacris regilla*) and their larvae were seen on 29 April reconnaissance surveys. Although the creek was surveyed, and the three ponds were surveyed, no California red-legged frogs (*Rana aurora draytonii*) (*adults or larvae*), nor western pond turtles were seen.

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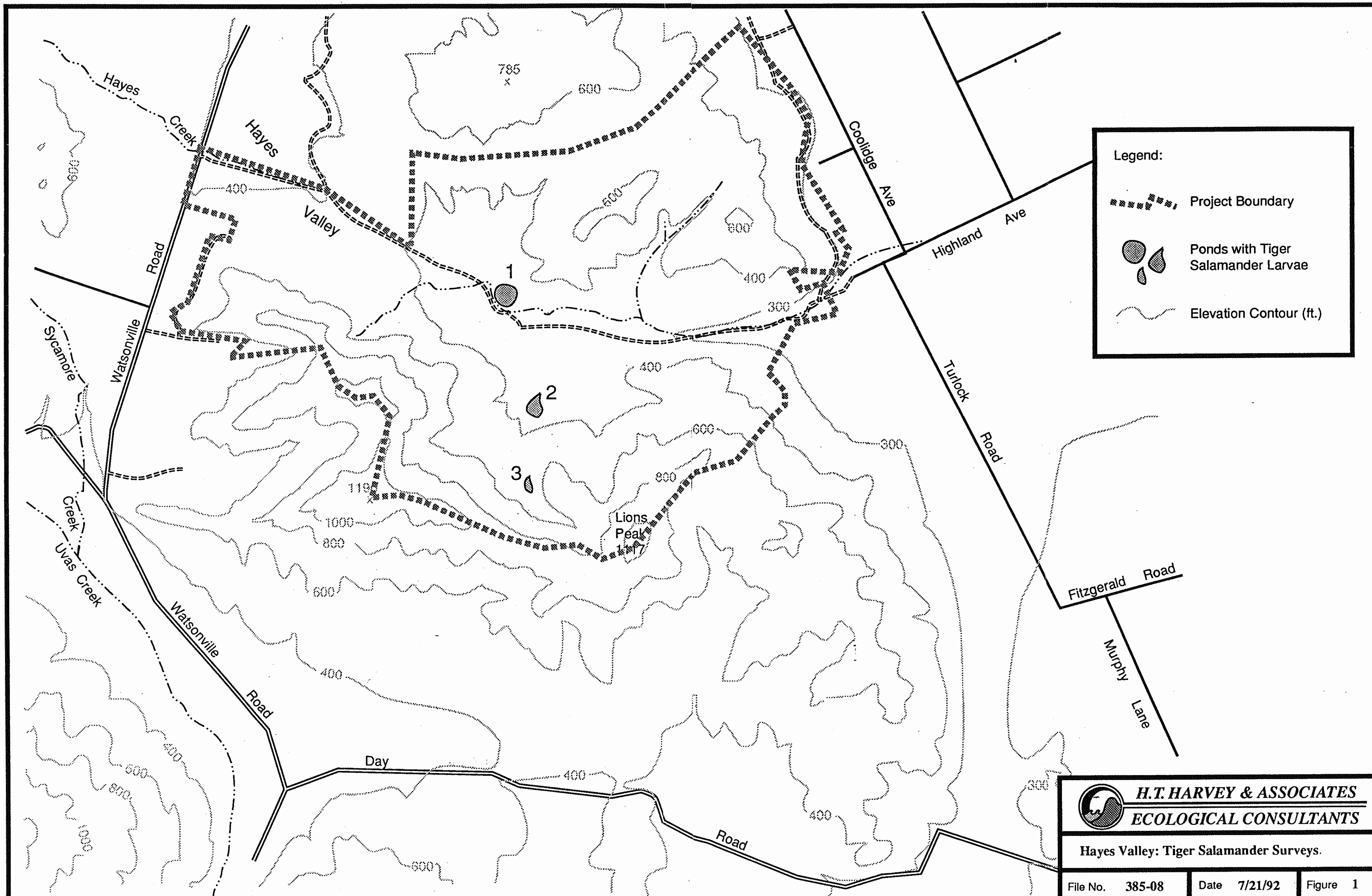


Legend:
Project Boundary
Ponds with Tiger Salamander Larvae
Elevation Contour (ft.)
Hayes Creek
Hayes Valley
Watsonville Road
Sycamore Creek
Uvas Creek
Coolidge Ave
Highland Ave
Turlock Road
Fitzgerald Road
Murphy Lane
Day Road
Lions Peak 1117
785
1
2
3
H.T. HARVEY & ASSOCIATES
ECOLOGICAL CONSULTANTS
Hayes Valley: Tiger Salamander Surveys.
File No. 385-08
Date 7/21/92
Figure 1

Approximately 75 California tiger salamander larvae were captured in pond number 2 on the April survey date. These salamanders were captured with a dipnet on the south side of the pond in a period of some 20 minutes of sampling.

Eight larvae were captured in the minnow seine in pond 2 on May 7, 1992. All were concentrated at the base of the dam. Five more larvae were caught in pond 3, (concentrated in the deeper water in the center of the pond). Pond 2 was not surveyed on that date.

Ponds 2 and 3 were totally dry by the 2 June survey date. A single larval California Tiger Salamander was captured in pond 2 with a dipnet by Malcolm Sproul. Additionally, at least 5 western pond turtles were observed in this pond.

AVIAN SURVEYS

Methods

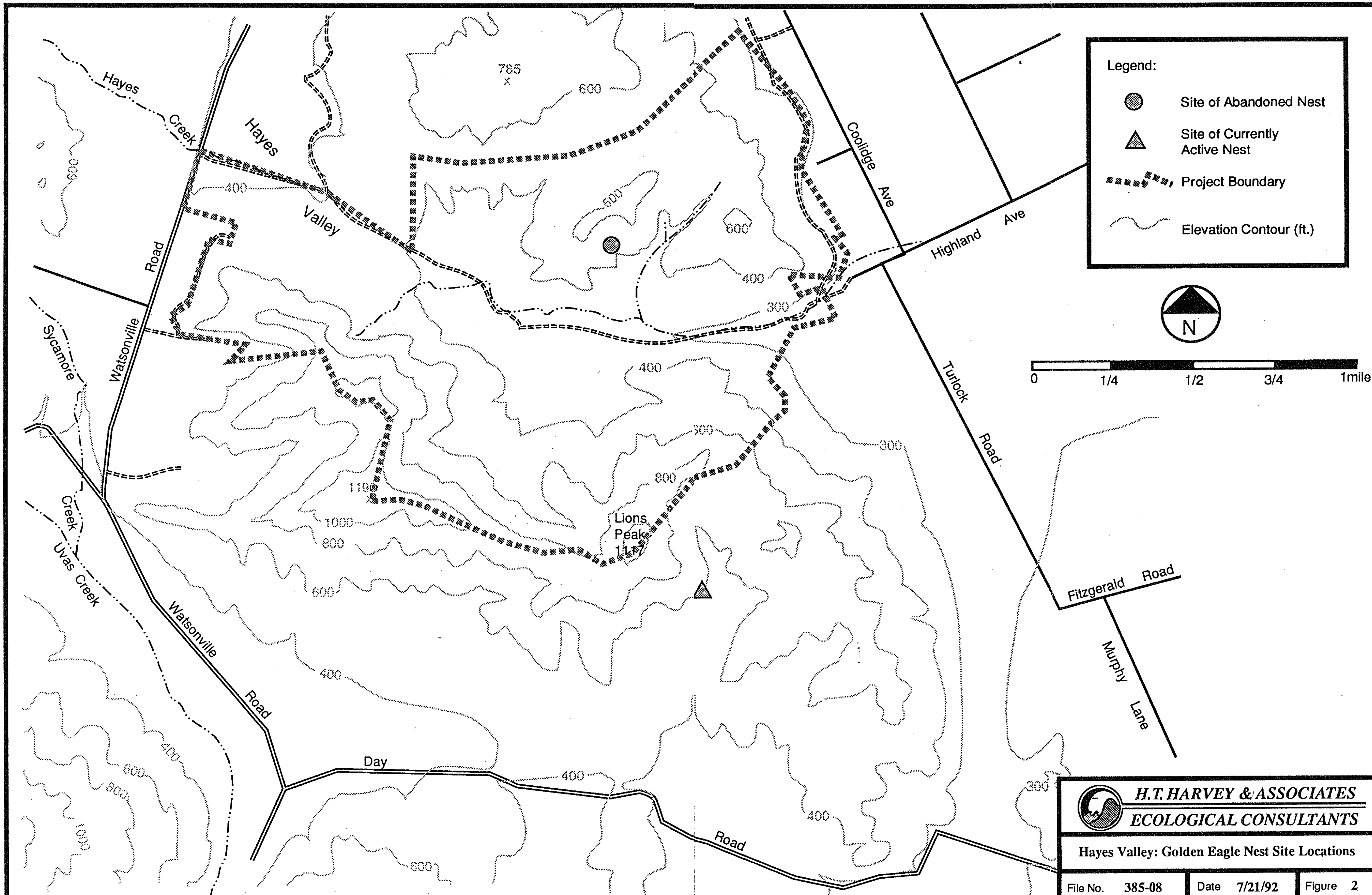
Surveys were conducted for two special-status avian species, the Golden Eagle (*Aquila chrysaetos*) and the Burrowing Owl (*Athene cunicularia*).

The entire site was walked and all accessible potential Golden Eagle nest trees were checked for nests. The site of an abandoned nest which had previously been identified was also checked (Figure 2). All Golden Eagles observed were noted and eagle locations were mapped. In addition, behavior of the birds was observed and recorded.

All potential Burrowing Owl habitat was walked. Owl biologists visually surveyed for owls and all potential owl burrows were checked for signs of owl use.

Results

Golden Eagles were observed on the site on 19 and 29 May and 4, 6 and 7 June. The maximum number of birds observed on the site was five on 19 May. This sighting involved two pairs of adults and one subadult (two or three years old). The subadult was associating with one of the pairs on the north slope of Lions Peak. One member of this pair was seen consistently foraging over the valley floor and the north slope up from the valley floor. The two pairs interacted (aerial displays) on the north slope of Lions Peak which indicated a probable territorial boundary in the area.



Legend:
Site of Abandoned Nest
Site of Currently Active Nest
Project Boundary
Elevation Contour (ft.)
N
0
1/4
1/2
3/4
1mile
Hayes Creek
Hayes Valley
Watsonville Road
Sycamore Creek
Uvas Creek
Day Road
Coolidge Ave
Highland Ave
Turlock Road
Fitzgerald Road
Murphy Lane
Lions Peak 1117
785
1190
H.T. HARVEY & ASSOCIATES
ECOLOGICAL CONSULTANTS
Hayes Valley: Golden Eagle Nest Site Locations
File No. 385-08
Date 7/21/92
Figure 2

A nest search of the entire Hayes Valley site was unsuccessful. The site of the abandoned nest which had been noted in previous surveys was also searched. No evidence remained of the nest.

However, a nest with two chicks was found off site on the south side of Lion's Peak (several thousand feet southeast of the property line, see figure 2). The nest contained two nearly fledged young on 7 June.

Although no nests were located on the property, the area appears to comprise an extensively used foraging area for this species.

No Burrowing Owls (or indications of the presence of this species on the site) were observed on the site, although appropriate habitat exists there.

PLANT SURVEYS

Methods

Surveys for several special-status plant species were conducted on the Hayes Valley property during the spring of 1992. Surveys were conducted in all biotic habitats within the planning area to be affected by development activities. Specifically, surveys were conducted in Hayes Valley and the hilly region situated to the north of the valley floor. Surveys were not performed in the relatively hilly region south of Hayes Valley.

A list of potential special-status plants was compiled using our prior survey reports, the California Natural Diversity Data Base reports (1990), and the California Native Plant Society's *Inventory of Rare and Endangered Vascular Plants of California* (1988). Surveys were conducted for the following species: Showy Indian Clover (*Trifolium amoenum*); Coyote Ceanothus (*Ceanothus ferrisae*); Santa Cruz Tarweed (*Holocarpha macradenia*); Setchell's Dudleya(*Dudleya setchellii*); Metcalf Canyon Jewelflower (*Streptanthus albidus* ssp.*albidus*); Uncommon Jewelflower (*Streptanthus albidus* ssp. *peramoenus*); Fragrant Fritillary (*Fritillaria liliacea*); and, the Mount Hamilton Thistle (*Cirsium campylon*). Surveys for these species were conducted on 29 and 30 April and 19 May, 1992.

The survey method involved hiking the areas within the planning area in a zig-zag pattern, transecting hilltops and slopes of the non-native annual grassland (serpentine substrate and non-serpentine substrate), oak woodland/savanna, and diablan sage scrub plant communities. In addition, channels, springs, ponds and seeps within the development area were searched for special-status plants.

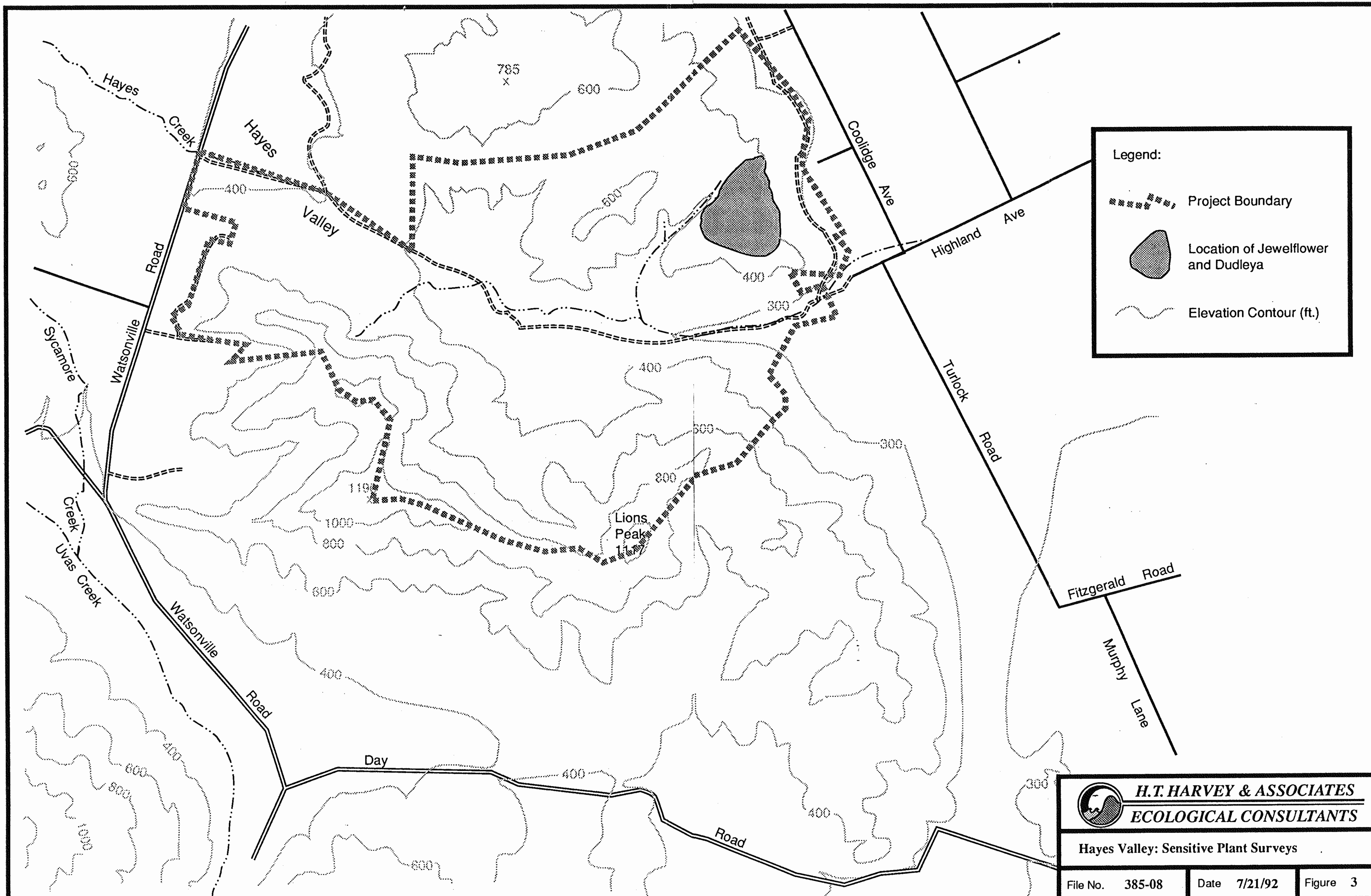
Results

Two special-status plant species were located on the Hayes Valley property. Both of these species were located only on the serpentine hills in the northeast portion of the site. These species are: Setchell's dudleya (*Dudleya setchelii*; Federal listing status: Candidate 1; CNPS List: 1B) and the uncommon jewelflower (*Streptanthus albidus* ssp. *peramoenus*; Federal listing status: Candidate 2; CNPS List 1B). Both of these species are serpentine endemics.

The estimated population size of the Setchell's dudleya is approximately 100 to 200 individuals; they are restricted to the south, east and west facing portions of the hills in the northeast section of the property (Figure 3). This species was found only within the area of serpentine substrate.

The uncommon jewelflower population is in excess of 10,000 individuals and covers approximately the same area as the Setchell's dudleya. Thus, this species was also found only within the area of serpentine substrate.

Surveys were conducted at the optimal time of year for identifying the special-status plants, and were conducted in a year of relatively plentiful rainfall for the geographic area. None of the other special-status plants were encountered during the field surveys and they are presumed absent from the site.



Hayes Valley: Sensitive Plant Surveys

File No. 385-08 | Date 7/21/92 | Figure 3

DETERMINATION OF JURISDICTIONAL WETLANDS ON THE LION'S GATE PROPERTY, MORGAN HILL, CALIFORNIA

May 13, 1994

Prepared for:

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LSA Project #HRP201

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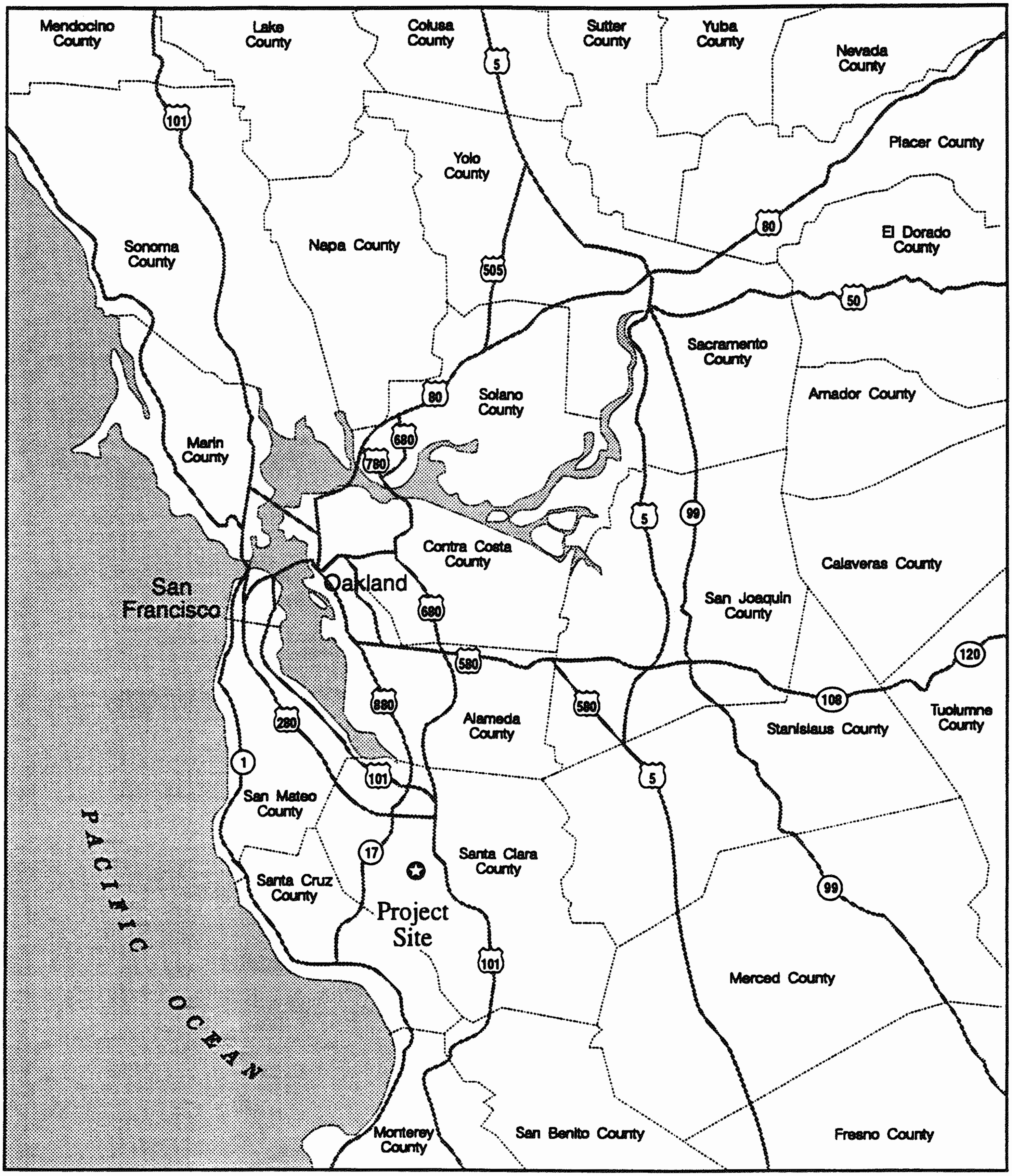
INTRODUCTION

OBJECTIVE

This report presents our observations and conclusions concerning the extent of U.S. Army Corps of Engineers (Corps) jurisdiction on the Hayes Valley property, which is located near the city of Morgan Hill in Santa Clara County, California. Hix Rubenstein, the owner of the property, intends to construct an 18 hole golf course and residential development on the property. Hix Rubenstein retained LSA to delineate the extent of jurisdictional waters of the United States, including wetlands, presently occurring on the approximately 80 percent of the property that would be affected by the project. The remainder of the property will not be disturbed and was not included in the jurisdictional determination study area.

PROJECT SITE

The approximately 1,320 acre property is located in the hills immediately west of Morgan Hill. The center of the property consists of a central valley with an east-west alignment. This valley contains the headwaters of the West Branch of Llagas Creek, which flows eastwards through the valley and continues off the property in the direction of Morgan Hill. In this report the creek will be referred to simply as "Llagas Creek". The northern side of the valley is bordered by a group of low hills that separate it from the Santa Clara Valley and the city of Morgan Hill. The property extends to the base of this ridge on its eastern border. The southern side is bordered by a ridgeline that includes Lion's Peak. A portion of the property extends down the southwest side of this ridge. The property also extends west into Hayes Valley and ends at Watsonville Road. Primary access to the property is by either Watsonville Road or Highland Avenue, which enters the property from the east and dead ends as a public road several hundred feet past the property line. Figure 1 locates the property in the region and Figure 2 shows the USGS quadrangle location of the property.



06-11-93(HRP201)

Figure 1

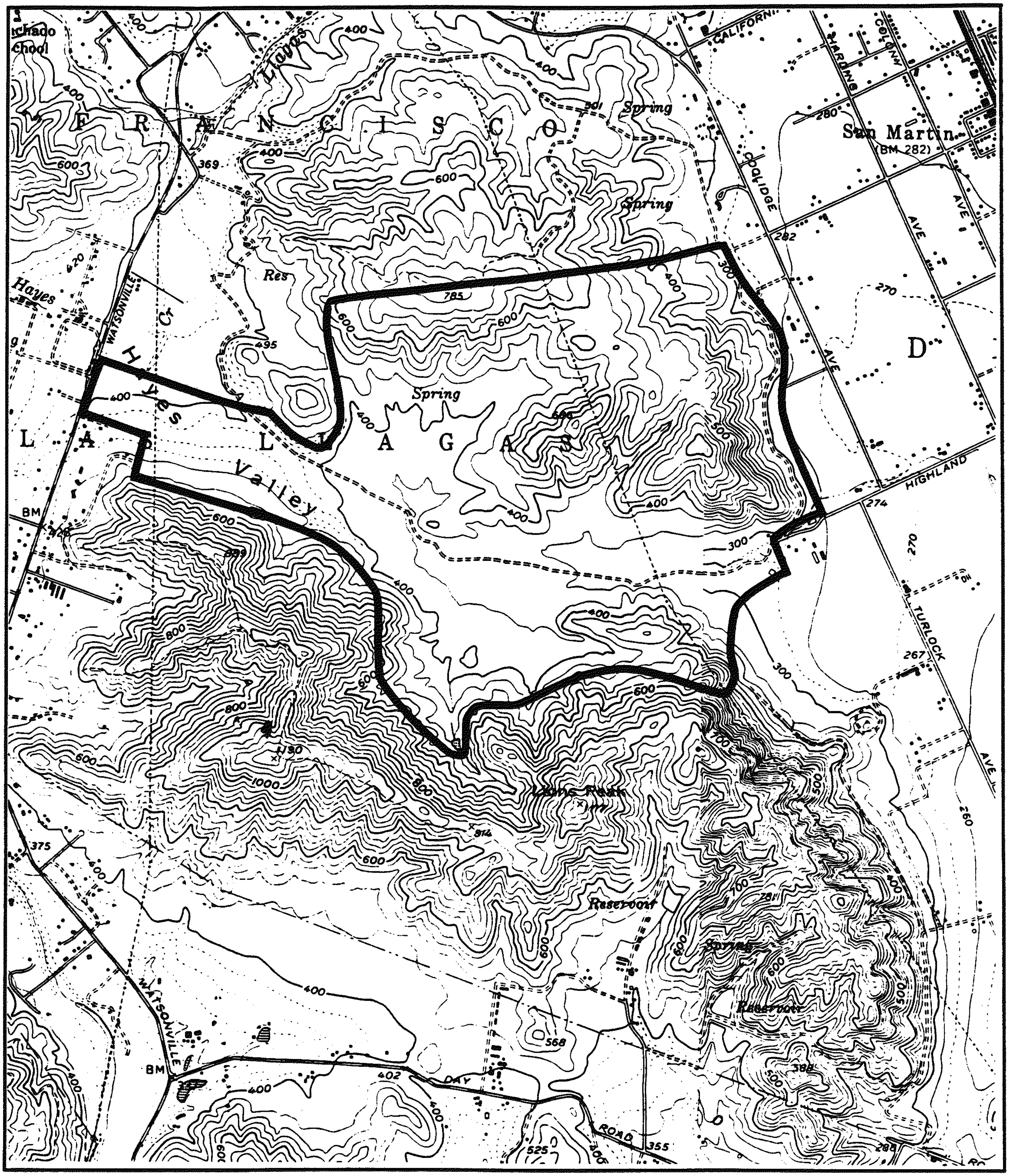
N

LSA

Scale in miles

0 20

Regional Location



06-11-93(HRP201)

Figure 2

N

LSA

Scale in feet
0 2000

Regional Location

SETTING

LAND USE

The majority of the site is used as rangeland for cattle. The site has a network of dirt roads and barbed wire fences to facilitate grazing of the property. Several stock ponds have been constructed on the site the site. The ranch facilities and several residences are located on Highland Avenue on the eastern edge of the property.

SURFACE HYDROLOGY

Drainage on the property consists of a network of intermittent and ephemeral streams that flow from the higher elevations on the perimeter of the central valley into the West Branch of Llagas Creek in the valley bottom. The creek has eight primary tributaries in the study area. Four of these drain the hills north of the valley and four originate on the southern ridgeline. These tributary streams flow during winter and spring months for varying periods and are dry the remainder of the year. Our study took place in late May and at this time all the tributaries were still carrying a low volume of runoff. The tributaries are numbered from 1 to 8 in this report for reference. The numbering of the tributaries is shown on Figure 3.

Several of the drainages have been dammed to create stockponds and all of these contained water at the time of the survey.

In addition to the West Branch of Llagas Creek and its tributaries, there are also two smaller drainages present on the northeastern corner of the property. These originate on the eastern side of the low hills north of Llagas Creek and flow east toward Morgan Hill. These drainages are referred to as "Drainage A" and "Drainage B" in this report.

Scattered over the study area are seeps where groundwater intersects the ground surface resulting in an area of saturated soil and wetland plant species. These often occur near or directly adjacent to streamcourses, but there are a few that occur on mid to upper slopes.

VEGETATION

The predominant vegetation types on the property are non-native annual grassland and oak woodland. The dominant grass species in both of these types are soft chess (*Bromus hordeaceous*)[1] and oats (*Avena* sp.). In the

[1] Plant taxonomy in this report is per the Jepson Manual (Hickman, 1993).

lower portions of the valley and adjacent to most of the drainageways the predominant grass species is Italian ryegrass (*Lolium multiflorum*), with Mediterranean barley (*Hordeum marinum* ssp. *gussoneanum*) also common.

Riparian woodland occurs along most of the West Branch of Llagas Creek and also occurs along limited stretches of some of the larger tributaries.

SOILS

The USDA Soil Conservation Service (SCS) mapped nine soil series in the survey area. The SCS soil map and series descriptions for the nine soils occurring on the site are contained in Appendix 4. The following brief descriptions of these soils are adapted from the *Soil Survey of Eastern Santa Clara Area, California* (USDA Soil Conservation Service, 1974).

Cropley clay occurs in a very small portion of the western field adjacent to Watsonville Road. Cropley soils develop on fans and terraces and are underlain by alluvium from mixed sources. Soil depth is 60 inches plus, permeability is slow and it is well drained. The surface layers are dark and cracks form when the soil is dry.

Garretson gravelly loam occurs in a single location south of Llagas Creek near the center of the valley. Garretson soils are valley soils that develop on stream benches and along drainageways and are underlain by alluvium from sedimentary rock. Garretson soils range from 40 to 60+ inches in depth and are well drained with moderate permeability.

Gilroy clay loam is the most widespread soil in the study area. It is an upland soil that covers most of the hills and slopes that border the valley on the north and south. The soil is 18 to 36 inches thick over bedrock and is well drained with moderate permeability. Gilroy soils form on basic igneous bedrock in uplands with slopes of 5 to 75 percent.

Hillgate silt loam occurs in a thin strip in the western field. It is an upland soil that occurs on terraces and is underlain by mixed alluvium. Soil depth is 60 inches plus, it is well drained and permeability is very slow.

Keefers clay loam occurs on gentle slopes south of Llagas Creek. It is an intermediate soil between the upland Gilroy and valley bottom Los Robles series. Keefers soils develop on older alluvial fans and are underlain by alluvium derived from basic igneous rock. The soil typically has a depth of 60 inches plus, is well drained, and has slow permeability.

Los Robles clay loam occurs in the valley bottom adjacent to Llagas Creek and extends up the larger tributary drainages. It is a valley bottom soil occurring on alluvial fans and underlain by stratified alluvium derived from basic igneous rock. It is approximately 58 inches deep, well drained, and has moderately slow permeability.

Maxwell clay occurs adjacent to the upper reaches of Llagas creek. It develops on alluvial fans and is underlain by serpentine alluvium. Soil depth is 60 inches plus, it is moderately well drained and permeability is slow. The surface layers are very dark and subject to deep cracking when dry.

Montara rocky clay loam occurs on upland slopes along the northern border of the property. Montara is an upland soil underlain by serpentine bedrock. The soil is 10 to 16 inches deep, excessively drained and has moderately slow permeability.

Vallecitos rocky loam occurs on the slopes surrounding the upper reaches of Llagas creek. It is an upland soil 13 to 30 inches deep underlain by sedimentary and metasedimentary bedrock. It is well drained with slow permeability.

None of these soils is listed by the SCS on their hydric soil list for Santa Clara County. Hydrophytic vegetation or other evidence of potential hydric conditions were primarily observed in valley soils (Los Robles, Maxwell, Keefers, Garretson, Cropley, Hillgate). No potential wetland characteristics were observed within the Gilroy, Montara or Vallecitos soil units on the property, so no wetland investigations were carried out in these units. These soils primarily occur on the ridges and hilltops surrounding the central valley.

REGULATORY BACKGROUND

The Corps is responsible under Section 404 of the Clean Water Act to regulate the discharge of dredged and fill material into waters of the United States. Waters of the U.S. and their lateral limits are defined in 33 CFR Part 328.3(a) and include streams that are tributaries to navigable waters and their adjacent wetlands. The lateral limits of jurisdiction for a non-tidal stream are measured at the line of ordinary high water (33 CFR Part 328.3-(e)) or the limit of adjacent wetlands (33 CFR Part 328.3(b)).

Waters and wetlands that cannot trace a continuous hydrological connection to a navigable water of the United States are not tributary to waters of the United States. These are termed "isolated wetlands". The Corps may or may not take jurisdiction over isolated wetlands depending on circumstances.

METHODS

HIGH WATER MARK CRITERIA

The ordinary high water mark is "that line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas."(33 CFR Part 328.3(e))

The ordinary high water mark is therefore determined by locating evidence of water flow sufficient to cause shelving, removal of terrestrial vegetation, or to establish a line on the bank. Indicators included the presence of flowing water, scour, silt deposits or debris deposits.

WETLAND CRITERIA

The extent of wetlands was determined using the routine determination method given in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory, Department of the Army, 1987). This method seeks to establish the presence of hydrophytic vegetation, hydric soils and wetland hydrology. By the federal definition, all three of these parameters must be present for an area to be considered a wetland.

Hydrophytic plant species are listed by the U.S. Fish and Wildlife Service in the *National List of Plant Species That Occur in Wetlands* (Reed, 1988). The *National List* identifies 5 categories of plant species according to their frequency of occurrence in wetlands. These categories are: *Obligate wetland plants* (OBL), plants that occur almost always in wetlands; *facultative wetland plants* (FACW), plants that usually occur in wetlands; *facultative plants* (FAC), plants that are equally likely to occur in wetlands or non-wetlands; *facultative upland plants* (FACU), plants that usually occur in uplands; and *obligate upland plants* (UPL), plants that occur almost always in non-wetlands. An area is considered to have hydrophytic vegetation when more than 50 percent of the dominant species in each stratum (tree, shrub and herb) are in the obligate wetland, facultative wetland or facultative categories.

Hydric soils are defined by the criteria set forth by the National Technical Committee for Hydric Soils (NTCHS). These criteria are given in the Wetlands Delineation Manual and are based on depth and duration of soil saturation. Hydric soils are commonly identified in the field by using indirect indicators. The most useful of these is soil color, which is strongly influenced by the frequency and duration of soil saturation. Hydric soils tend to have dark (low chroma) colors which are often accompanied by reddish mottles (iron mottles) or grey colors (gleying). These colors are all caused by anaerobic, reduced soil conditions that are brought about by prolonged soil saturation.

Under natural conditions, development of hydrophytic vegetation and hydric soils are dependent on a third characteristic, wetland hydrology. The wetland hydrology criterion is met if the area experiences inundation or soil saturation to the surface for 10 - 15 days during the growing season in an average rainfall year. This is the most difficult criterion to measure in the field due to seasonal and annual variations in water availability. Some of the indicators that are commonly used to identify wetland hydrology include recent sediment deposits, surface scour and oxidized root channels (rhizospheres) caused by prolonged anaerobic conditions.

SURVEY METHODS

An LSA biologist surveyed the site on May 27-28 and June 7. Drainages were searched along their entire lengths for evidence of ordinary high water marks. Widths of waters of the United States were measured at the ordinary high water mark.

Streams were separated into segments based on changes in width. The average width of each segment was determined by measuring the width of the stream at several representative points along the segment. Areas of watercourses were calculated by multiplying field-measured width by the length of the stream segment as determined on a one inch equals 400 feet topographic map.

Each stream segment was assigned a number for reference. Segments were given two-part numbers, reflecting tributary ordination (first-order, second-order, *etc.*) and an identifying number. For example, stream segment 2-3 is the third segment of second order. Segment designations for segments occurring in drainages A and B are preceded by the appropriate letter, i.e. A-1-1 or B-1-1. All mapped stream segments are listed with their lengths and average widths in Table A of Appendix 1. The location of the segments is shown on Figure 3. Figure 3 is reproduced from a 1 inch to 400 foot topographic map of the property based on conditions in July 1991.

As a component of the cattle operation, stock ponds have been constructed in a number of locations throughout the site by erecting earthen dams within drainageways. Stock ponds which were constructed within a jurisdictional watercourse were considered waters of the U.S. These are also shown on Figure 3.

Potential wetlands were determined by visual observation of low-lying areas, hydrophytic vegetation and/or surface indicators of wetland hydrology. The reasoning for choosing particular sample site locations is discussed in the results section. At each sample point the vegetation was cataloged, hydrological indicators were searched for and the soil was sampled. In all, 23 sample sites were established. The field data sheets for these sites are included as Appendix 2 of this report. Their locations are shown on Figure 3.

Photographs were taken of hydrological features at several locations on the project site. These are included in Appendix 3. The locations and orientations of the photographs are shown on Figure 3.

RESULTS

The total Corps jurisdictional area on the property is 9.4 acres and has the following breakdown:

Watercourses	3.9 acres
Stock Ponds	1.3 acres
Seeps	0.2 acres
Wetlands	4.0 acres

	9.4 acres

The following sections discuss our findings concerning each of these jurisdictional types.

STREAMS

Stream segments subject to Corps jurisdiction in the project area are shown on Figure 3. Table A in Appendix 1 lists all of the segments and gives their lengths, widths and areas. Stream channels on the property comprise a total jurisdictional area of 170,173 square feet (3.91 acres).

Each of the stream segments exhibit evidence of annual flow in the form of scour caused by runoff during and after winter storms. In some cases the scour was obvious, with bare soil and vertical banks caused by undercutting. In other cases, evidence of scour was limited to the presence of a sharp angle or nickpoint between the channel bottom and the banks. In many of the tributaries, cattle had trampled the drainage bottom into a broad band of muddy hoofprints with all physical evidence of the original ordinary high water mark obliterated. Most of these areas were either still moist, saturated or inundated at the time of our survey. In these cases the limit of jurisdiction was placed at the outer edge of the trampled area.

In the project area the average stream width ranged from 1-2 feet in the upper reaches of the tributary drainages to 8-10 feet on Llagas Creek.

STOCK PONDS

Stock ponds constructed within a jurisdictional watercourse also qualify as waters of the United States. Seven of these are located on the project site. Their areas are listed in Table C of Appendix 1. The limit of jurisdiction for the stock ponds is the high water mark, which was obvious at all of the ponds due to drifted debris, lack of vegetation and scour. The total area of mapped stock ponds is 54,905 square feet (1.3 acres).

SEEPS

Seeps qualify as wetlands based on readily observable saturation of the soil to the surface for an extended period of time. There are 5 seeps in the study area that are adjacent to jurisdictional streamcourses. These are shown on Figure 3. There are also several mid-slope seeps present on the property. These are not adjacent to other waters of the United States and are therefore isolated waters and not subject to Corps jurisdiction.

ADJACENT WETLANDS

Approximately 4 acres of wetlands were identified in the Hayes Valley portion of the study area. Wetlands were searched for at five locations in the Llagas Creek valley, but none of these locations were determined to be jurisdictional wetlands.

Llagas Creek Valley

Italian ryegrass, a facultative (FAC) species, occurs in and adjacent to most of the jurisdictional stream segments in the study area. It also dominates the lower elevation swale and basin areas in the valleys. The dominance of a FAC species in these areas meant that they met the hydrophytic vegetation criteria and were potential adjacent wetlands. Sample sites were located at various representative locations within the Italian ryegrass community in order to determine if any of these areas met the soils and hydrology criteria for adjacent wetlands.

Sample site 1 was located in a community of Italian ryegrass and mediterranean barley that is adjacent to Tributary 2 near its confluence with Llagas Creek. Italian ryegrass and Mediterranean barley are both FAC species. The soil, mapped as Los Robles by the SCS, lacks hydric indicators. There is no physical evidence of wetland hydrology. Of the three necessary criteria, site 1 meets only the vegetation criteria and thus is not a jurisdictional wetland.

Site 2 was located south of Llagas Creek between Tributaries 1 and 3. The area sampled is a shallow swale which lacks an ordinary high water mark. In most respects site 2 is similar to site 1. The vegetation is Italian ryegrass and Mediterranean barley, the soil lacks hydric indicators and there is no evidence of wetland hydrology. The only differences are that brodiea (*Triteleia laxa*), an upland herb, constitutes a significant portion of the vegetation (5%) and the soil series is Keefers rather than Los Robles.

Site 3 was located immediately adjacent to Tributary 3 in a low area where the tributary widens. There is a broad expanse of Italian ryegrass adjacent to this area and the sample site was placed about midway between the outer edge of this community and the edge of the tributary. The site has hydrophytic vegetation because it is completely dominated by Italian ryegrass. The site is not an adjacent wetland, however, because the soil is a typical Keefers soil and there is no evidence of wetland hydrology outside of the ordinary high water mark of Tributary 3.

Site 4 was located adjacent to stock pond 7 in an area dominated by mediterranean barley. The soil here is black (10YR 2/1 on the Munsell soil color chart). Dark soil color can be a hydric indicator, but dark soil color is a standard trait of the Maxwell series. Since the Maxwell series is not considered to be a hydric soil, low soil chroma cannot be considered a useful indicator in this instance. There were no additional hydric indicators observed, so the soil is not hydric. There is no physical evidence of wetland hydrology.

Site 5 was located on the upper reaches of Llagas Creek in a wide, moist area similar to the one sampled at site 3. As at site 4, the soil is a dark Maxwell clay with no other indication of hydric conditions. The vegetation is hydrophytic, a combination of Italian ryegrass and Mediterranean barley. There was once again no evidence of wetland hydrology.

Summary - Llagas Creek Valley

All the Llagas Creek Valley sample sites have similar characteristics. All are dominated either by annual rye grass, mediterranean barley, or a combination of the two. Both species are FAC, so all the sample sites had hydrophytic vegetation.

Hydric indicators are not present in the soil at any of the sample sites. Sites 5 and 6 have low soil chroma, but this is a standard feature of the soil series these sites are located in and is therefore not a reliable indicator of hydric conditions.

Physical evidence of ponding or soil saturation, which would be an indicator of wetland hydrology, was not observed at any of the sample sites.

All the sample sites had hydrophytic vegetation, but none of them had hydric soils or wetland hydrology. The sample sites therefore meet only one of the three necessary wetland criteria and are not jurisdictional wetlands.

Hayes Valley

Jurisdictional wetlands occur on the northern boundary of the western field and extend from Watsonville road to the crest that divides the Llagas Creek valley from Hayes Valley. The wetlands occur in four units which have been labeled W1 through W4 on Figure 3. Wetland W1 is the largest wetland, covering over 3 acres. The remaining 3 wetlands add up to less than 1 acre. Each of the wetlands will be discussed in turn.

Wetland W1

Wetland W1 includes a swale, which drains the upper part of the Hayes Valley portion of the property, and the basin that the swale flows into. The swale begins at the crest that separates Hayes Valley from Llagas Creek Valley and runs down a shallow slope along the northern boundary of the property for 800 feet, where it flows into the basin. The center of the swale was determined to be a wetland and sample sites 6 through 14 were established in and adjacent to the swale to determine the boundaries of the wetland. The sites are located along three transects; 6-10, 11-12 and 13-14. The sites located in the swale (sites 6, 7, 10, 12 and 14) all had dark grayish brown (10YR 3/2) soil color with brown (7.5YR 3/3) iron mottles. Small manganese concretions were also present at sample site 6. These indicators are sufficient to indicate hydric soil conditions. The vegetation in the swale is primarily Italian ryegrass with Mediterranean barley common in wetter spots. Sample sites 8, 9, 11 and 13 were located adjacent to the swale and were not determined to meet the jurisdictional criteria. They establish that the width of the wetland is between 30 and 50 feet. The vegetation beyond the edge of the swale is still dominated by Italian ryegrass, but the subdominant grasses are softchess and oats, upland-adapted species, rather than facultative Mediterranean barley. The soils are brown (7.5YR 3/3) and lack mottles or other hydric indicators. The boundaries were mapped between sample site transects by observing the vegetation transition from annual ryegrass to an annual rygrass-upland grass mix, and by observing the transition from dark soils to lighter brown soils. No sample sites were located on the northern side of the swale because a sharp slope break and a sharp transition to oat-dominated grassland clearly mark the wetland boundary.

At one location (sample site 12) the wetland expands to a width of 75 feet due to the presence of a wetland area on the slope adjacent to the swale. The soil in this area is more distinctly mottled than in the swale and the vegetation is dominated by bermuda grass (*Cyonodon dactylis*), a FAC species, and hyssop loosestrife (*Lythrum hyssopifolia*), a FACW species. This area was not mapped as a seep because the ground had already dried at the time of our study. The vegetation and soils in this area are nevertheless more hydrophytic than in the swale below it.

The swale flows into a wide, shallow basin at the bottom of the slope. This basin was mapped by the SCS as Hillgate loam, but the surface soil is black clay. The actual soil series is probably Cropley clay. The dark clay soil fills the entire basin and extends for some distance up the slope to the south. Sample site 14 was located within the basin and site 16 was located on the slope to the south. Hydric soil indicators in the form of iron mottles are present at both locations, indicating that the dark clay is a hydric soil unit. The vegetation at both sites is hydrophytic with Italian ryegrass and hyssop loosestrife dominating. Site 15 was located just upslope from 16 and establishes the wetland boundary. It is located in an area dominated by Italian ryegrass and slender birdsbeak (*Cordylanthus tenuis*). The soil at 15 is Keefers and lacks hydric indicators.

Wetland W2

Sample site 20 is located in a small depression near the northern boundary of the study area. The soil is a mottled Keefers and the most numerous plant species is Mediterranean barley with Italian ryegrass also occurring as a dominant. Subdominant plant species present included rabbitsfoot grass (*Polypogon monspeliensis*), hyssop loosestrife, and doveweed (*Eremocarpus setigerous*). The first two of these are FACW while the third, dove weed, is UPL. The ground surface at the center of the depression was 10-15 percent bare due to the suppression of vegetation by ponded water. This is an indicator of wetland hydrology. The wetland boundary was determined by a sharp transition to a mixed community of Italian ryegrass and upland grasses and forbs.

Wetland W3

Most of wetland W3 is a seasonal pool that is dominated by OBL and FACW species, including prostrate knotweed (*Polygonum aviculare*), rabbitsfoot grass, slender birdsbeak and spikerush (*Eleocharis sp.*). Sample site 19 was located in the center of this area and the soil in the pool is mottled near the surface and has low chroma. Site 19 is determined to be a jurisdictional wetland site.

The remainder of the wetland is a low area adjacent to the pool which has characteristics similar to those in wetland W1. Sample sites 17 and 18 define the wetland boundary. Site 17 is in an Italian ryegrass community with a black clay soil that lacks hydric indicators. This site lacks hydric soil and is not a jurisdictional wetland. Site 18, located 25 feet to the north, has the same type of soil with the exception that there are iron mottles, gley mottles and small manganese concretions in the uppermost 18 inches of the soil. These indicate hydric soil conditions. The vegetation community of Italian ryegrass and Mediterranean barley is hydrophytic, so wetland hydrology can be assumed and the site meets the jurisdictional wetland criteria.

Wetland W4

Wetland W4 is a depressional area similar to wetland W2, but larger. Sample site 22 was located within the depression and it had a hydrophytic Italian ryegrass-Mediterranean barley vegetation community and a black, mottled, Cropley clay soil. Sample site 23 describes the adjacent non-wetland characteristic. The vegetation community is still hydrophytic and is similar to that at site 22. The main difference is the presence of yellow star thistle (*Centaurea solstitialis*) at site 23 as a non-dominant. The soil at site 23 is a dark Keefers that lacks hydric indicators.

CONCLUSIONS

The total Corps jurisdictional area on the property is 9.4 acres. Jurisdictional stream segments, stock ponds and seeps in the West Branch of Llagas Creek Valley total 5.4 acres. There are no jurisdictional wetlands there. The remaining 4.0 acres consists of jurisdictional wetlands in Hayes Valley. The locations of all jurisdictional areas on the property are shown on Figure 3 and the areas of each wetland, pond, seep and stream segment are given in Appendix A.

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APPENDIX 1: AREAS OF JURISDICTIONAL WETLANDS

Table A - Area of Stream Segments
West Branch of Llagas Creek and Major Tributaries

West Branch Llagas Creek and Minor Tributaries

Stream Segment	Width (feet)	Length (feet)	Area (Sq.Ft.)
1-1	9	580	5,220
1-2	9	250	2,250
1-3	7.5	1,150	8,625
1-4	8.5	975	8,288
1-5	5	550	2,750
1-6	4	325	1,300
1-7	7	425	2,975
1-8	4	275	1,100
1-9	6	725	4,350
1-10	4	750	3,000
1-11	3	775	2,325
1-12	8	625	5,000
1-13	8	300	2,400
1-14	10	200	2,000
1-15	3	775	2,325
1-16	7	300	2,100
1-17	10	350	3,500
1-18	15	700	10,500
1-19	1.5	350	525
1-20	1	600	600
SUBTOTAL		10,980	71,133

Minor Tributaries			
2-1	2	250	500
2-12	1	100	100
SUBTOTAL		350	600

Tributary #1

Stream Segment	Width (feet)	Length (feet)	Area (Sq.Ft.)
2-2	3	150	450
2-3	2	1,050	2,100
3-1	2	200	400
3-2	8	75	600
3-3	15	250	3,750
3-4	1	450	450
3-5	2	350	700
3-6	1	750	750
3-7	1	500	500
3-8	12.5	325	4,063
3-9	1	900	900
3-10	12	150	1,800
3-11	8	275	2,200
3-12	4	125	500
4-1	1	150	150
4-2	1	250	250
SUBTOTAL		**5,950**	**19,563**

Tributary #2

Stream Segment	Width (feet)	Length (feet)	Area (Sq.Ft.)
2-4	7	100	700
2-5	2	50	100
2-6	5	600	3,000
2-7	15	150	2,250
2-8	2	450	900
2-9	4	400	1,600
2-10	1.5	200	300
2-11	1	375	375
3-13	4	1,150	4,600
SUBTOTAL		**3,475**	**13,825**

Tributary #3

Stream Segment	Width (feet)	Length (feet)	Area (Sq.Ft.)
2-13	2	175	350
2-14	1.5	175	263
2-15	3	550	1,650
2-16	10	375	3,750
2-17	1	1,025	1,025
2-18	8	300	2,400
2-19	15	150	2,250
2-20	5	775	3,875
2-21	2	275	550
2-22	5	100	500
2-23	1	200	200
3-14	5	225	1,125
4-3	5	125	625
4-4	1.5	700	1,050
4-5	1	150	150
4-6	1.5	1,150	1,725
SUBTOTAL		**6,450**	**21,488**

Tributary #4

Stream Segment	Width (feet)	Length (feet)	Area (Sq.Ft.)
2-24	2	925	1,850
3-15	1	375	375
3-16	1	275	275
SUBTOTAL		**1,575**	**2,500**

Tributary #5

Stream Segment	Width (feet)	Length (feet)	Area (Sq.Ft.)
2-25	4	325	1,300
2-26	2	125	250
2-27	4	650	2,600
2-28	8	250	2,000
2-29	4	200	800
2-30	8	225	1,800
2-31	1	450	450
SUBTOTAL		**2,225**	**9,200**

Tributary #6

Stream Segment	Width (feet)	Length (feet)	Area (Sq.Ft.)
2-32	10	175	1,750
2-33	5	750	3,750
2-34	3	175	525
2-35	2	725	1,450
3-17	1	425	425
3-18	2	150	300
3-19	8	200	1,600
3-20	1.5	725	1,088
3-21	3	1,625	4,875
4-7	3	125	375
SUBTOTAL		**5,075**	**16,138**

Tributary #7

Stream Segment	Width (feet)	Length (feet)	Area (Sq.Ft.)
2-36	1.5	250	375
2-37	3	550	1,650
2-38	2	150	300
2-39	1.5	200	300
SUBTOTAL		**1,150**	**2,625**

Tributary #8

Stream Segment	Width (feet)	Length (feet)	Area (Sq.Ft.)
2-40	1	300	300
2-41	1	325	325
2-42	3	150	450
SUBTOTAL		**775**	**1,075**

Drainage A

Stream Segment	Width (feet)	Length (feet)	Area (Sq.Ft.)
1-1	9	250	2,250
1-2	5	875	4,375
1-3	2.5	425	1,063
2-1	1.5	575	863
2-2	1.5	550	825
2-3	2	400	800
SUBTOTAL		**3,075**	**10,176**

Drainage B

Stream Segment	Width (feet)	Length (feet)	Area (Sq.Ft.)
1-1	5	300	1,500
2-1	1	350	350
SUBTOTAL		**650**	**1,850**

Totals

	Length (feet)	Area (Sq.Ft.)	Area (A.C.)
West Branch Llagas Creek	10,980	71,133	1.63
Minor Tributaries	350	600	0.01
Tributary 1	5,950	19,563	0.45
Tributary 2	3,475	13,825	0.32
Tributary 3	6,450	21,488	0.49
Tributary 4	1,575	2,500	0.06
Tributary 5	2,225	9,200	0.21
Tributary 6	5,075	16,138	0.37
Tributary 7	1,150	2,625	0.06
Tributary 8	775	1,075	0.03
Subtotal for West Branch Llagas Creek Drainage Area	38,005	158,147	3.63
Drainage A	3,075	10,176	0.20
Drainage B	650	1,850	0.04
TOTALS FOR STUDY AREA	41,630	170,173	3.91

Table B - Area of Seeps

Seep	Dimensions	Area
S1	30 x 50	1,500
S2	20 x 40	800
S3	40 x 100	4,000
S4	35 x 35	1,225
S5	15 x 40	600
TOTAL		**8,125 (0.2 acre)**

Table C - Area of Ponds

Pond	Dimensions	Area
P1	70 x 140	9,800
P2	40 x 100	4,000
P3	20 x 50	1,000
P4	30 x 50	1,500
P5	20 x 45	900
P6	15 x 45	675
P7	Irregular	37,030
TOTAL		**54,905 (1.3 acres)**

Table D - Area of Wetlands

Wetland	Area
W1	3.24
W2	0.06
W3	0.43
W4	0.23
TOTAL	3.96

APPENDIX 2: FIELD DATA SHEETS (1-23)

Transect and Plot # 1 Date 6/4 Investigator LOHMANN

SOILS

Yes	No	
		Texture @ 10 inches depth: X non-sandy ___ sandy
		SCS Series mapped: LOS ROBLES
___	X	Is matrix chroma ≤ 1? Matrix color 7.5 YR 3/3
___	X	If mottled, matrix chroma ≤ 2? Mottled (orange/red or grey) ___ If yes, depth range ___ Color

All soil textures (complete regardless of texture)

Yes	No	
___	X	Soil saturated at or near surface all of the year? (peraquic moisture regime)
___	X	Aquic moisture regime at suborder level?
___	X	Sulfidic odor? If yes, depth? ___
___	X	Histic epipedon: >30% organic in an 8-16" layer near soil surface (> 20% in sandy soil)

Non-sandy soils (do not complete if soil is sandy)

Yes	No	
___	X	Organic soil (Histosols): >50% in top 32"?
___	X	Gleyed? If yes, predominant color(s) ___ ___ mottled ___ depth range ___ continuous ___ range
___	X	Fe or Mn concretions >2mm diameter within 3" of surface?

Sandy soils (complete only if texture is sandy)

Yes	No	
___	___	Organic pan? If yes, depth ___
___	___	Vertical dark organic streaks (may stain fingers)
___	X	Summary: Hydric soil?

HYDROLOGY

Yes	No	
___	X	Inundated? If yes, depth ___
___	X	Water table encountered? If yes, depth to water table ___
___	X	Can water be squeezed or shaken from the surface soil?
___	X	Algal mats present?
___	X	Oxidized rhizospheres
___	X	Sulfidic odor? If yes, depth ___
___	X	Aerenchyma tissue, prop roots, pneumatophores, hypertrophied lenticels, or floating stems or leave
___	X	Channels or other indicators of flow patterns observable?*
___	X	Drift/debris lines present?*
___	X	Watermarks or sediment on vegetation, detritus, structures?*
___	X	Shallow root systems; adventitious roots?*

*Secondary indicator

Yes	No	
___	X	Summary: Wetland hydrologic regime?

Notes: NON-WETLAND

WETLAND DETERMINATION (ROUTINE)

Project: Lions Gate Plot# 1 Elevation ____________
Adjacent waterbody: ______________________ Location: ______________

TYPICAL/ATYPICAL/MAN-INDUCED DETERMINATION

Has vegetation been significantly altered by man? ___ yes X no Grazed
Has soil been significantly altered by man? ___ yes X no
Has hydrologic regime been significantly altered by man? ___ yes X no
(Include notes for any yes answers to above, including description of change and estimated date of change)

VEGETATION Estimated total vegetative cover: 100

A. Forbs (3 to 5 dominants within 5 feet of sample point)

Species	Indicator Status	% cover (estimate)
1. Lolium Perenne	1. FAC	1. 60
2. Hordeum Hystrix	2. FAC	2. 30
3.	3.	3.
4.	4.	4.
5.	5.	5.

B. Shrubs/saplings (3 to 5 dominants within 5 feet of sample point)

Species	Indicator Status	% cover (estimate)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.
5.	5.	5.

C. Trees/woody vines (3 to 5 dominants within 30 feet of sample point)

Species	Indicator Status	% cover (estimate)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.
5.	5.	5.

If any species show the following characteristics, place the corresponding letter in the "indicator status" column: A buttressed trunks, B pnuematophores, C adventitious roots, D shallow root systems, E aerenchymous roots, stems or leaves, F polymorphic leaves, G floating leaves or stems, H others (specify____)

Summary: % of wetland species ____ % cover by wetland species (estimate) __

Transect and Plot # 2 Date 6/7 Investigator LOHMANN

SOILS

Yes	No	
		Texture @ 10 inches depth: X non-sandy ___ sandy
		SCS Series mapped: KEEFERS CLAY LOAM
___	X	Is matrix chroma ≤ 1? Matrix color 7.5 YR 3/2
___	X	If mottled, matrix chroma ≤ 2? Mottled (orangered or grey) ___ If yes, depth range ___ Colo

All soil textures (complete regardless of texture)

Yes	No	
___	X	Soil saturated at or near surface all of the year? (peraquic moisture regime)
___	X	Aquic moisture regime at suborder level?
___	X	Sulfidic odor? If yes, depth? ___
___	X	Histic epipedon: >30% organic in an 8-16" layer near soil surface (> 20% in sandy soil)

Non-sandy soils (do not complete if soil is sandy)

Yes	No	
___	X	Organic soil (Histosols): >50% in top 32"?
___	X	Gleyed? If yes, predominant color(s) ___ ___ mottled ___ depth range ___ continuous ___ range
___	X	Fe or Mn concretions >2mm diameter within 3" of surface?

Sandy soils (complete only if texture is sandy)

Yes	No	
___	___	Organic pan? If yes, depth ___
___	___	Vertical dark organic streaks (may stain fingers)
___	X	**Summary:** Hydric soil?

HYDROLOGY

Yes	No	
___	✓	Inundated? If yes, depth ___
___	✓	Water table encountered? If yes, depth to water table ___
___	✓	Can water be squeezed or shaken from the surface soil?
___	✓	Algal mats present?
___	✓	Oxidized rhizospheres
___	✓	Sulfidic odor? If yes, depth ___
___	✓	Aerenchyma tissue, prop roots, pneumatophores, hypertrophied lenticels, or floating stems or lea
___	✓	Channels or other indicators of flow patterns observable?*
___	✓	Drift/debris lines present?*
___	✓	Watermarks or sediment on vegetation, detritus, structures?*
___	✓	Shallow root systems, adventitious roots?*

*Secondary indicator

Yes	No	
___	X	**Summary:** Wetland hydrologic regime?

Notes: NON-WETLAND

WETLAND DETERMINATION (ROUTINE)

Project: Lions Gate Plot# 2 Elevation ____
Adjacent waterbody: ____ Location: ____

TYPICAL/ATYPICAL/MAN-INDUCED DETERMINATION

Has vegetation been significantly altered by man? ___ yes X no
Has soil been significantly altered by man? ___ yes X no
Has hydrologic regime been significantly altered by man? ___ yes X no
(Include notes for any yes answers to above, including description of change and estimated date of change)

VEGETATION Estimated total vegetative cover: 100%

A. Forbs (3 to 5 dominants within 5 feet of sample point)

Species	Indicator Status	% cover (estimate)
1. Lolium perenne	1. FAC	1. 50
2. Hordeum jubatum	2. FAC	2. 30
3. Bromus (?) laxa	3. UPL	3. 5
4.	4.	4.
5.	5.	5.

B. Shrubs/saplings (3 to 5 dominants within 5 feet of sample point)

Species	Indicator Status	% cover (estimate)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.
5.	5.	5.

C. Trees/woody vines (3 to 5 dominants within 30 feet of sample point)

Species	Indicator Status	% cover (estimate)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.
5.	5.	5.

If any species show the following characteristics, place the corresponding letter in the "indicator status" column: A buttressed trunks. B pneumatophores. C adventitious roots. D shallow root systems. E aerenchymous roots, stems or leaves. F polymorphic leaves. G floating leaves or stems. H others (specify ____)

Summary: % of wetland species ____ % cover by wetland species (estimate) ____

Transect and Plot # 3 Date 6/7 Investigator S. LOHMANN

SOILS

Yes	No	
		Texture @ 10 inches depth: X non-sandy ___ sandy
		SCS Series mapped: KEEFERS CLAY LOAM
___	X	Is matrix chroma ≤ 1? Matrix color 7.5 YR 3/2
___	X	If mottled, matrix chroma ≤ 2? Mottled (orange/red or grey) ___ If yes, depth range ___ Col:

All soil textures (complete regardless of texture)

Yes	No	
___	X	Soil saturated at or near surface all of the year? (peraquic moisture regime)
___	X	Aquic moisture regime at suborder level?
___	X	Sulfidic odor? If yes, depth? ___
___	X	Histic epipedon: >30% organic in an 8-16" layer near soil surface (> 20% in sandy soil)

Non-sandy soils (do not complete if soil is sandy)

Yes	No	
___	X	Organic soil (Histosols): >50% in top 32"?
___	X	Gleyed? If yes, predominant color(s) ___ ___ mottled ___ depth range ___ continuous ___ range
___	X	Fe or Mn concretions >2mm diameter within 3" of surface?

Sandy soils (complete only if texture is sandy)

Yes	No	
___	___	Organic pan? If yes, depth ___
___	___	Vertical dark organic streaks (may stain fingers)
___	X	Summary: Hydric soil?

HYDROLOGY

Yes	No	
___	X	Inundated? If yes, depth ___
___	X	Water table encountered? If yes, depth to water table ___
___	X	Can water be squeezed or shaken from the surface soil?
___	X	Algal mats present?
___	X	Oxidized rhizospheres
___	X	Sulfidic odor? If yes, depth ___
___	X	Aerenchyma tissue, prop roots, pneumatophores, hypertrophied lenticels, or floating stems or lea
___	X*	Channels or other indicators of flow patterns observable?
___	X*	Drift/debris lines present?
___	X*	Watermarks or sediment on vegetation, detritus, structures?
___	X*	Shallow root systems, adventitious roots?

*Secondary indicator

Yes	No	
___	X	Summary: Wetland hydrologic regime?

Notes: NON-WETLAND

WETLAND DETERMINATION (ROUTINE)

Project: Lion's Gate Plot# 3 Elevation
Adjacent waterbody: Location:

TYPICAL/ATYPICAL/MAN-INDUCED DETERMINATION

Has vegetation been significantly altered by man? ___ yes X no
Has soil been significantly altered by man? ___ yes X no
Has hydrologic regime been significantly altered by man? ___ yes X no
(Include notes for any yes answers to above, including description of change and estimated date of change)

VEGETATION Estimated total vegetative cover: 100

A. Forbs (3 to 5 dominants within 5 feet of sample point)

Species	Indicator Status	% cover (estimate)
1. Lolium perenne	1. FAC	1. 95
2.	2.	2.
3.	3.	3.
4.	4.	4.
5.	5.	5.

B. Shrubs/saplings (3 to 5 dominants within 5 feet of sample point)

Species	Indicator Status	% cover (estimate)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.
5.	5.	5.

C. Trees/woody vines (3 to 5 dominants within 30 feet of sample point)

Species	Indicator Status	% cover (estimate)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.
5.	5.	5.

If any species show the following characteristics, place the corresponding letter in the "indicator status" column: A buttressed trunks, B pnuematophores, C adventitious roots, D shallow root systems, E aerenchymous roots, stems or leaves, F polymorphic leaves, G floating leaves or stems, H others (specify

Summary: % of wetland species ___ % cover by wetland species (estimate) ___

Transect and Plot # 4 Date 6/7 Investigator S. LOHMANN

SOILS

Yes	No	
		Texture @ 10 inches depth: X non-sandy ___ sandy
		SCS Series mapped: MAXWELL CLAY
X		Is matrix chroma ≤ 1? Matrix color 10 YR 2/1
	X	If mottled, matrix chroma ≤ 2? Mottled (orange/red or grey) ____ If yes, depth range ____ Color

All soil textures (complete regardless of texture)

Yes	No	
	X	Soil saturated at or near surface all of the year? (peraquic moisture regime)
	X	Aquic moisture regime at suborder level?
	X	Sulfidic odor? If yes, depth? ____
	X	Histic epipedon: >30% organic in an 8-16" layer near soil surface (> 20% in sandy soil)

Non-sandy soils (do not complete if soil is sandy)

Yes	No	
	X	Organic soil (Histosols): >50% in top 32"?
	X	Gleyed? If yes, predominant color(s) ____ ___ mottled ____ depth range ____ continuous ___ range
	X	Fe or Mn concretions >2mm diameter within 3" of surface?

Sandy soils (complete only if texture is sandy)

Yes	No	
		Organic pan? If yes, depth ____
		Vertical dark organic streaks (may stain fingers)
	X	Summary: Hydric soil? COLOR ALONE IS INSUFFICIENT EVIDENCE OF HYDRIC CONDITIONS

HYDROLOGY

Yes	No	
	X	Inundated? If yes, depth ____
	X	Water table encountered? If yes, depth to water table ____
	X	Can water be squeezed or shaken from the surface soil?
	X	Algal mats present?
	X	Oxidized rhizospheres
	X	Sulfidic odor? If yes, depth ____
	X	Aerenchyma tissue, drop roots, pneumatophores, hypertrophied lenticels, or floating stems or leaves
	X*	Channels or other indicators of flow patterns observable?
	X*	Drift/debris lines present?
	X*	Watermarks or sediment on vegetation, detritus, structures?
	X*	Shallow root systems, adventitious roots?

*Secondary indicator

Yes	No	
	X	Summary: Wetland hydrologic regime?

Notes: NON-WETLAND

WETLAND DETERMINATION (ROUTINE)

Project: LION'S GATE Plot# 4 Elevation ____
Adjacent waterbody: ____ Location: ____

TYPICAL/ATYPICAL/MAN-INDUCED DETERMINATION

Has vegetation been significantly altered by man? ___ yes X no
Has soil been significantly altered by man? ___ yes X no
Has hydrologic regime been significantly altered by man? X yes ___ no NEARBY CREEK DAMMED
(Include notes for any yes answers to above, including description of change and estimated date of change)

VEGETATION Estimated total vegetative cover: ____

A. Forbs (3 to 5 dominants within 5 feet of sample point)

Species	Indicator Status	% cover (estimate)
1. HORDEUM HYSTRIX	1. FAC	1. 70
2. CONVOLVULUS ARVENSIS	2. UPL	2. 10
3. LOLIUM PERENNE	3. FAC	3. 10
4.	4.	4.
5.	5.	5.

B. Shrubs/saplings (3 to 5 dominants within 5 feet of sample point)

Species	Indicator Status	% cover (estimate)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.
5.	5.	5.

C. Trees/woody vines (3 to 5 dominants within 30 feet of sample point)

Species	Indicator Status	% cover (estimate)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.
5.	5.	5.

If any species show the following characteristics, place the corresponding letter in the "indicator status" column: A buttressed trunks, B pnuematophores, C adventitious roots, D shallow root systems, E aerenchymous roots, stems or leaves, F polymorphic leaves, G floating leaves or stems, H others (specify ____)

Summary: % of wetland species ____ % cover by wetland species (estimate) ____

Transect and Plot # 5 Date 6/7 Investigator S. LOHMANN

SOILS

Yes	No	
		Texture @ 10 inches depth: X non-sandy ___ sandy
		SCS Series mapped: MAXWELL CLAY
X	___	Is matrix chroma ≤ 1? Matrix color 10 YR 2/1
___	X	If mottled, matrix chroma ≤ 2? Mottled (orange/red or grey) ___ If yes, depth range ___ Cc

All soil textures (complete regardless of texture)

Yes	No	
___	X	Soil saturated at or near surface all of the year? (peraquic moisture regime)
___	X	Aquic moisture regime at suborder level?
___	X	Sulfidic odor? If yes, depth? ___
___	X	Histic epipedon: >30% organic in an 8-16" layer near soil surface (> 20% in sandy soil)

Non-sandy soils (do not complete if soil is sandy)

Yes	No	
___	X	Organic soil (Histosols): >50% in top 32"?
___	X	Gleyed? If yes, predominant color(s) ___ ___ mottled ___ depth range ___ continuous ___ range
___	X	Fe or Mn concretions >2mm diameter within 3" of surface?

Sandy soils (complete only if texture is sandy)

Yes	No	
___	___	Organic pan? If yes, depth ___
___	___	Vertical dark organic streaks (may stain fingers)
___	X	Summary: Hydric soil?

COLOR ALONE IS INSUFFICIENT EVIDENCE OF HYDRIC CONDITIONS

HYDROLOGY

Yes	No	
___	X	Inundated? If yes, depth ___
___	X	Water table encountered? If yes, depth to water table ___
___	X	Can water be squeezed or shaken from the surface soil?
___	X	Algal mats present?
X	___	Oxidized rhizospheres FEW
___	X	Sulfidic odor? If yes, depth ___
___	X	Aerenchyma tissue, prop roots, pneumatophores, hypertrophied lenticels, or floating stems or le
___	X*	Channels or other indicators of flow patterns observable?
___	X*	Drift/debris lines present?
___	X*	Watermarks or sediment on vegetation, detritus, structures?
___	X*	Shallow root systems, adventitious roots?

*Secondary indicator

Yes	No	
___	X	Summary: Wetland hydrologic regime?

Notes: NON-WETLAND

WETLAND DETERMINATION (ROUTINE)

Project: Lion's Gate Plot# 5 Elevation______
Adjacent waterbody: ______ Location: ______

TYPICAL/ATYPICAL/MAN-INDUCED DETERMINATION

Has vegetation been significantly altered by man? ___ yes X no
Has soil been significantly altered by man? ___ yes X no
Has hydrologic regime been significantly altered by man? ___ yes X no
(Include notes for any yes answers to above, including description of change and estimated date of change)

VEGETATION Estimated total vegetative cover: 100

A. Forbs (3 to 5 dominants within 5 feet of sample point)

Species	Indicator Status	% cover (estimate)
1. Lolium Perenne	1. FAC	1. 57
2. Hordeum Hystrix	2. FAC	2. 37
3.	3.	3.
4.	4.	4.
5.	5.	5.

B. Shrubs/saplings (3 to 5 dominants within 5 feet of sample point)

Species	Indicator Status	% cover (estimate)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.
5.	5.	5.

C. Trees/woody vines (3 to 5 dominants within 30 feet of sample point)

Species	Indicator Status	% cover (estimate)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.
5.	5.	5.

If any species show the following characteristics, place the corresponding letter in the "indicator status" column: A buttressed trunks. B pnuematophores. C adventitious roots. D shallow root systems. E aerenchymous roots. stems or leaves. F polymorphic leaves. G floating leaves or stems. H others (specify______)

Summary: % of wetland species ___ % cover by wetland species (estimate) ___

Transect and Plot # 6 Date 7/ Investigator S. LOHMANN

SOILS

Yes	No	
		Texture @ 10 inches depth: X non-sandy ___ sandy
		SCS Series mapped: HILLCATE ... 100M
	X	Is matrix chroma ≤ 1? Matrix color 10 YR 3/2
X		If mottled, matrix chroma ≤ 2? Mottled (orange/red or grey) X If yes, depth range Surface Col: 7.5 YR 3/3

All soil textures (complete regardless of texture)

Yes	No	
	X	Soil saturated at or near surface all of the year? (peraquic moisture regime)
X		Aquic moisture regime at suborder level?
	X	Sulfidic odor? If yes, depth?
	X	Histic epipedon: >30% organic in an 8-16" layer near soil surface (> 20% in sandy soil)

Non-sandy soils (do not complete if soil is sandy)

Yes	No	
	X	Organic soil (Histosols): >50% in top 32"?
	X	Gleyed? If yes, predominant colors ___ mottled ___ depth range ___ continuous ___ range
	X	Fe or Mn concretions >2mm diameter within 3" of surface?

Sandy soils (complete only if texture is sandy)

Yes	No	
		Organic pan? If yes, depth ___
		Vertical dark organic streaks (may stain fingers)
X		Summary: Hydric soil?

Mn CONCRETIONS <2 mm
DISTINCT MOTTLING

HYDROLOGY

Yes	No	
	X	Inundated? If yes, depth ___
	X	Water table encountered? If yes, depth to water table ___
	X	Can water be squeezed or shaken from the surface soil?
	X	Algal mats present?
	X	Oxidized rhizospheres
	X	Sulfidic odor? If yes, depth ___
	X	Aerenchyma tissue, prop roots, pneumatophores, hypertrophied lenticels, or floating stems or lea...
	X	Channels or other indicators of flow patterns observable?*
	X	Drift/debris lines present?*
	X	Watermarks or sediment on vegetation, detritus, structures?*
	X	Shallow root systems, adventitious roots?*

SITE LOCATED WITHIN SHALLOW SWALE

*Secondary indicator

Yes	No	
X		Summary: Wetland hydrologic regime?

WETLAND HYDROLOGY IS ASSUMED DUE TO PRESENCE OF HYDROPHYTIC VEGETATION AN[D] HYDRIC SOIL

Notes:

WETLAND DETERMINATION (ROUTINE)

Project: Lion's Gate Plot# 6 Elevation ____
Adjacent waterbody: ____ Location: ____

TYPICAL/ATYPICAL/MAN-INDUCED DETERMINATION

Has vegetation been significantly altered by man? ___yes X no
Has soil been significantly altered by man? ___yes X no
Has hydrologic regime been significantly altered by man? ___ yes X no
(Include notes for any yes answers to above, including description of change and estimated date of change)

VEGETATION Estimated total vegetative cover: 100

A. Forbs (3 to 5 dominants within 5 feet of sample point)

Species	Indicator Status	% cover (estimate)
1. Lolium perenne	1. FAC	1. 60
2. Hordeum hystrix	2. FAC	2. 25
3.	3.	3.
4.	4.	4.
5.	5.	5.

B. Shrubs/saplings (3 to 5 dominants within 5 feet of sample point)

Species	Indicator Status	% cover (estimate)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.
5.	5.	5.

C. Trees/woody vines (3 to 5 dominants within 30 feet of sample point)

Species	Indicator Status	% cover (estimate)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.
5.	5.	5.

If any species show the following characteristics, place the corresponding letter in the "indicator status" column: A buttressed trunks. B pnuematophores. C adventitious roots. D shallow root systems. E aerenchymous roots, stems or leaves. F polymorphic leaves. G floating leaves or stems. H others (specify____)

Summary: % of wetland species ____ % cover by wetland species (estimate) __

Transect and Plot # 7 Date 7/9 Investigator S. LOHMANN

SOILS

Yes	No	
		Texture @ 10 inches depth: X non-sandy ___ sandy
		SCS Series mapped: HILLGATE SILT LOAM
___	X	Is matrix chroma ≤ 1? Matrix color 10 YR 3/2
X	___	If mottled, matrix chroma ≤ 2? Mottled (orange/red or grey) YES If yes, depth range 6"+ Col: 7.5 YR 3/3

All soil textures (complete regardless of texture)

Yes	No	
___	X	Soil saturated at or near surface all of the year? (peraquic moisture regime)
X	___	Aquic moisture regime at suborder level?
___	X	Sulfidic odor? If yes, depth? ___
___	X	Histic epipedon: >30% organic in an 8-16" layer near soil surface (> 20% in sandy soil)

Non-sandy soils (do not complete if soil is sandy)

Yes	No	
___	X	Organic soil (Histosols): >50% in top 32"?
___	X	Gleyed? If yes, predominant color(s) ___ ___ mottled ___ depth range ___ continuous ___ range
X	___	Fe or Mn concretions >2mm diameter within 3" of surface?

Sandy soils (complete only if texture is sandy)

Yes	No	
___	___	Organic pan? If yes, depth ___
___	___	Vertical dark organic streaks (may stain fingers)

Yes	No	
X	___	Summary: Hydric soil?

HYDROLOGY

Yes	No	
___	X	Inundated? If yes, depth ___
___	X	Water table encountered? If yes, depth to water table ___
___	X	Can water be squeezed or shaken from the surface soil?
___	X	Algal mats present?
X	___	Oxidized rhizospheres
___	X	Sulfidic odor? If yes, depth ___
___	X	Aerenchyma tissue, prop roots, pneumatophores, hypertrophied lenticels, or floating stems or lea[ves]
___	X	*Channels or other indicators of flow patterns observable?
___	X	*Drift/debris lines present?
___	X	*Watermarks or sediment on vegetation, detritus, structures?
___	X	*Shallow root systems, adventitious roots?

*Secondary indicator

Yes	No	
X	___	Summary: Wetland hydrologic regime?

Notes: JURISDICTIONAL WETLAND

WETLAND DETERMINATION (ROUTINE)

Project: LION'S GATE Plot# 7 Elevation
Adjacent waterbody: Location:

TYPICAL/ATYPICAL/MAN-INDUCED DETERMINATION

Has vegetation been significantly altered by man? ___ yes X no
Has soil been significantly altered by man? ___ yes X no
Has hydrologic regime been significantly altered by man? ___ yes X no
(Include notes for any yes answers to above, including description of change and estimated date of change)

VEGETATION Estimated total vegetative cover: 100

A. Forbs (3 to 5 dominants within 5 feet of sample point)

Species	Indicator Status	% cover (estimate)
1. Lolium perenne	1. FAC	1. 60
2. Hordeum hystrix	2. FAC	2. 35
3.	3.	3.
4.	4.	4.
5.	5.	5.

B. Shrubs/saplings (3 to 5 dominants within 5 feet of sample point)

Species	Indicator Status	% cover (estimate)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.
5.	5.	5.

C. Trees/woody vines (3 to 5 dominants within 30 feet of sample point)

Species	Indicator Status	% cover (estimate)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.
5.	5.	5.

If any species show the following characteristics, place the corresponding letter in the "indicator status" column: A buttressed trunks, B pnuematophores, C adventitious roots, D shallow root systems, E aerenchymous roots, stems or leaves, F polymorphic leaves, G floating leaves or stems, H others (specify ______________________________)

Summary: % of wetland species ____ % cover by wetland species (estimate) __

Transect and Plot # 8 Date 7/9 Investigator S. LOHMANN

SOILS

Yes	No	
		Texture @ 10 inches depth: X non-sandy ___ sandy
		SCS Series mapped: HILLGATE SILT LOAM
___	X	Is matrix chroma ≤ 1? Matrix color 10 YR 3/3
___	X	If mottled, matrix chroma ≤ 2? Mottled (orange/red or grey) ___ If yes, depth range ___ Color

All soil textures (complete regardless of texture)

Yes	No	
___	X	Soil saturated at or near surface all of the year? (peraquic moisture regime)
___	X	Aquic moisture regime at subcorder level?
___	X	Sulfidic odor? If yes, depth? ___
___	X	Histic epipedon: >30% organic in an 8-16" layer near soil surface (> 20% in sandy soil)

Non-sandy soils (do not complete if soil is sandy)

Yes	No	
___	X	Organic soil (Histosols: >50% in top 32")?
___	X	Gleyed? If yes, predominant color(s) ___ ___ mottled ___ depth range ___ continuous ___ range
___	X	Fe or Mn concretions >2mm diameter within 3" of surface?

Sandy soils (complete only if texture is sandy)

Yes	No	
___	___	Organic pan? If yes, depth ___
___	___	Vertical dark organic streaks (may stain fingers)
___	X	Summary: Hydric soil?

HYDROLOGY

Yes	No	
___	___	Inundated? If yes, depth ___
___	___	Water table encountered? If yes, depth to water table ___
___	___	Can water be squeezed or shaken from the surface soil?
___	___	Algal mats present?
___	___	Oxidized rhizospheres
___	___	Sulfidic odor? If yes, depth ___
___	___	Aerenchyma tissue, prop roots, pneumatophores, hypertrophied lenticels, or floating stems or leaves
___	___ *	Channels or other indicators of flow patterns observable?
___	___ *	Drift/debris lines present?
___	___ *	Watermarks or sediment on vegetation, detritus, structures?
___	___ *	Shallow root systems, adventitious roots?

*Secondary indicator

Yes	No	
___	X	Summary: Wetland hydrologic regime?

Notes: NON-WETLAND

WETLAND DETERMINATION (ROUTINE)

Project: LION'S GATE Plot# 8 Elevation

Adjacent waterbody: Location:

TYPICAL/ATYPICAL/MAN-INDUCED DETERMINATION

Has vegetation been significantly altered by man? X yes ___ no
Has soil been significantly altered by man? X yes ___ no
Has hydrologic regime been significantly altered by man? X yes ___ no
(Include notes for any yes answers to above, including description of change and estimated date of change)

VEGETATION Estimated total vegetative cover: 100

A. Forbs (3 to 5 dominants within 5 feet of sample point)

Species	Indicator Status	% cover (estimate)
1. LOLIUM PERENNE	1. FAC	1. 60
2. AVENA SP.	2. UPl	2. 20
3. CORDYLANTHUS TENUIS	3. UPl	3. 12
4.	4.	4.
5.	5.	5.

B. Shrubs/saplings (3 to 5 dominants within 5 feet of sample point)

Species	Indicator Status	% cover (estimate)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.
5.	5.	5.

C. Trees/woody vines (3 to 5 dominants within 30 feet of sample point)

Species	Indicator Status	% cover (estimate)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.
5.	5.	5.

If any species show the following characteristics, place the corresponding letter in the "indicator status" column: A buttressed trunks. B pnuematophores. C adventitious roots. D shallow root systems. E aerenchymous roots. stems or leaves. F polymorphic leaves. G floating leaves or stems. H others (specify

Summary: % of wetland species ____ % cover by wetland species (estimate) __

Transect and Plot # 9 Date 7/9 Investigator S. LOHMANN

SOILS

Yes	No	
		Texture @ 10 inches depth: ___ non-sandy ___ sandy
		SCS Series mapped: KEEFERS
___	X	Is matrix chroma ≤ 1? Matrix color: 7.5 YR 3/3
___	X	If mottled, matrix chroma ≤ 2? Mottled (orange/red or grey) ___ If yes, depth range ___ Color:

All soil textures (complete regardless of texture)

Yes	No	
___	X	Soil saturated at or near surface all of the year? (peraquic moisture regime)
___	X	Aquic moisture regime at suborder level?
___	X	Sulfidic odor? If yes, depth? ___
___	X	Histic epipedon: >30% organic in an 8-16" layer near soil surface (> 20% in sandy soil)

Non-sandy soils (do not complete if soil is sandy)

Yes	No	
___	X	Organic soil (Histosols: >50% in top 32")?
___	X	Gleyed? If yes, predominant color(s) ___ ___ mottled ___ depth range ___ continuous ___ range
___	X	Fe or Mn concretions >2mm diameter within 3" of surface?

Sandy soils (complete only if texture is sandy)

Yes	No	
___	___	Organic pan? If yes, depth ___
___	___	Vertical dark organic streaks (may stain fingers)
___	X	**Summary:** Hydric soil?

HYDROLOGY

Yes	No	
___	___	Inundated? If yes, depth ___
___	___	Water table encountered? If yes, depth to water table ___
___	___	Can water be squeezed or shaken from the surface soil?
___	___	Algal mats present?
___	___	Oxidized rhizospheres
___	___	Sulfidic odor? If yes, depth ___
___	___	Aerenchyma tissue, prop roots, pneumatophores, hypertrophied lenticels, or floating stems or leaves
___	___	*Channels or other indicators of flow patterns observable?
___	___	*Drift/debris lines present?
___	___	*Watermarks or sediment on vegetation, detritus, structures?
___	___	*Shallow root systems, adventitious roots?

*Secondary indicator

Yes	No	
___	X	**Summary:** Wetland hydrologic regime?

Notes: NON-WETLAND

WETLAND DETERMINATION (ROUTINE)

Project: LION'S GATE Plot: 9 Elevation ____________
Adjacent waterbody: ________________ Location: ____________

TYPICAL/ATYPICAL/MAN-INDUCED DETERMINATION

Has vegetation been significantly altered by man? ___ yes X no
Has soil been significantly altered by man? ___ yes X no
Has hydrologic regime been significantly altered by man? ___ yes X no
(Include notes for any yes answers to above, including description of change and estimated date of change)

VEGETATION Estimated total vegetative cover: 100%

A. Forbs (3 to 5 dominants within 5 feet of sample point)

Species	Indicator Status	% cover (estimate)
1. Lolium perenne	1. FAC	1. 50
2. Bromus mollis	2. FACU	2. 25
3. Cordylanthus tenuis	3. UPL	3. 10
4.	4.	4.
5.	5.	5.

B. Shrubs/saplings (3 to 5 dominants within 5 feet of sample point)

Species	Indicator Status	% cover (estimate)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.
5.	5.	5.

C. Trees/woody vines (3 to 5 dominants within 30 feet of sample point)

Species	Indicator Status	% cover (estimate)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.
5.	5.	5.

If any species show the following characteristics, place the corresponding letter in the "indicator status" column: A buttressed trunks, B pneumatophores, C adventitious roots, D shallow root systems, E aerenchymous roots, stems or leaves, F polymorphic leaves, G floating leaves or stems, H others (specify ________________)

Summary: % of wetland species ____ % cover by wetland species (estimate) ____

Transect and Plot # 10 Date 7/9 Investigator S. LOHMANN

SOILS

600' FROM FENCE CORNER

Yes	No	
		Texture @ 10 inches depth: X non-sandy ___ sandy
		SCS Series mapped: HILLGATE
___	X	Is matrix chroma ≤ 1? Matrix color 10 YR 3/2
X	___	If mottled, matrix chroma ≤ 2? Mottled (orange/red or grey) RED If yes, depth range SURF Col: 10 YR 3/4

All soil textures (complete regardless of texture)

Yes	No	
X	X	Soil saturated at or near surface all of the year? (peraquic moisture regime)
X	___	Aquic moisture regime at suborder level?
___	X	Sulfidic odor? If yes, depth? ______
___	X	Histic epipedon: >30% organic in an 8-16" layer near soil surface (> 20% in sandy soil)

Non-sandy soils (do not complete if soil is sandy)

Yes	No	
___	X	Organic soil (Histosols): >50% in top 32"?
___	X	Gleyed? If yes, predominant color(s) ______ ___ mottled ___ depth range ___ continuous ___ range
___	X	Fe or Mn concretions >2mm diameter within 3" of surface?

Sandy soils (complete only if texture is sandy)

Yes	No	
___	___	Organic pan? If yes, depth ____
___	___	Vertical dark organic streaks (may stain fingers)
X	___	Summary: Hydric soil?

HYDROLOGY

Yes	No	
___	___	Inundated? If yes, depth ____
___	___	Water table encountered? If yes, depth to water table ____
___	___	Can water be squeezed or shaken from the surface soil?
___	___	Algal mats present?
___	___	Oxidized rhizospheres
___	___	Sulfidic odor? If yes, depth ____
___	___	Aerenchyma tissue, prop roots, pneumatophores, hypertrophied lenticels, or floating stems or lea
___	___*	Channels or other indicators of flow patterns observable?
___	___*	Drift/debris lines present?
___	___*	Watermarks or sediment on vegetation, detritus, structures?
___	___*	Shallow root systems, adventitious roots?

*Secondary indicator

SAMPLE SITE LOCATED IN SWALE

Yes	No	
X	___	Summary: Wetland hydrologic regime?

Notes: JURISDICTIONAL WETLAND

WETLAND DETERMINATION (ROUTINE)

Project: LION'S GATE Plot# 10 Elevation

Adjacent Waterbody: Location:

TYPICAL/ATYPICAL/MAN-INDUCED DETERMINATION

Has vegetation been significantly altered by man? ___ yes X no
Has soil been significantly altered by man? ___ yes X no
Has hydrologic regime been significantly altered by man? ___ yes X no
(Include notes for any yes answers to above, including description of change and estimated date of change)

VEGETATION Estimated total vegetative cover: 100

A. Forbs (3 to 5 dominants within 5 feet of sample point)

Species	Indicator Status	% cover (estimate)
1. Lolium Perenne	1. FAC	1. 50
2. Hordeum Hystrix	2. FAC	2. 30
3. Cordylanthus tenuis	3. UPL	3. 7
4.	4.	4.
5.	5.	5.

B. Shrubs/saplings (3 to 5 dominants within 5 feet of sample point)

Species	Indicator Status	% cover (estimate)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.
5.	5.	5.

C. Trees/woody vines (3 to 5 dominants within 30 feet of sample point)

Species	Indicator Status	% cover (estimate)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.
5.	5.	5.

If any species show the following characteristics, place the corresponding letter in the "indicator status" column: A buttressed trunks, B pnuematophores, C adventitious roots, D shallow root systems, E aerenchymous roots, stems or leaves, F polymorphic leaves, G floating leaves or stems, H others (specify ___)

Summary: % of wetland species ___ % cover by wetland species (estimate) ___

Transect and Plot # 11 Date 7/9 Investigator S. LOHMANN

SOILS

Yes	No	
		Texture @ 10 inches depth: X non-sandy ___ sandy
		SCS Series mapped: KEEFERS
___	X	Is matrix chroma ≤ 1? Matrix color 7.5 YR 3/3
___	X	If mottled, matrix chroma ≤ 2? Mottled (orange/red or grey) NO If yes, depth range ___ Color:

All soil textures (complete regardless of texture)

Yes	No	
___	X	Soil saturated at or near surface all of the year? (peraquic moisture regime)
___	X	Aquic moisture regime at subordet level?
___	X	Sulfidic odor? If yes, depth? ___
___	X	Histic epipedon: >30% organic in an 8-16" layer near soil surface (> 20% in sandy soil)

Non-sandy soils (do not complete if soil is sandy)

Yes	No	
___	X	Organic soil (Histosols: >50% in top 32")?
___	X	Gleyed? If yes, predominant color(s) ___ ___ mottled ___ depth range ___ continuous ___ range
___	X	Fe or Mn concretions >2mm diameter within 3" of surface?

Sandy soils (complete only if texture is sandy)

Yes	No	
___	___	Organic pan? If yes, depth ___
___	___	Vertical dark organic streaks (may stain fingers)
___	X	Summary: Hydric soil?

HYDROLOGY

Yes	No	
___	X	Inundated? If yes, depth ___
___	X	Water table encountered? If yes, depth to water table ___
___	X	Can water be squeezed or shaken from the surface soil?
___	X	Algal mats present?
___	X	Oxidized rhizospheres
___	X	Sulfidic odor? If yes, depth ___
___	X	Aerenchyma tissue, prop roots, pneumatophores, hypertrophied lenticels, or floating stems or leav
___	X	*Channels or other indicators of flow patterns observable?
___	X	*Drift/debris lines present?
___	X	*Watermarks or sediment on vegetation, detritus, structures?
___	X	*Shallow root systems, adventitious roots?

*Secondary indicator

Yes	No	
___	X	Summary: Wetland hydrologic regime?

Notes: NON-WETLAND

WETLAND DETERMINATION (ROUTINE)

Project: LION'S GATE Plot: 11 Elevation: ____
Adjacent waterbody: ____ Location: ____

TYPICAL/ATYPICAL/MAN-INDUCED DETERMINATION

Has vegetation been significantly altered by man? ___ yes X no
Has soil been significantly altered by man? ___ yes X no
Has hydrologic regime been significantly altered by man? ___ yes X no
(Include notes for any yes answers to above, including description of change and estimated date of change)

VEGETATION Estimated total vegetative cover: ____

A. Forbs (3 to 5 dominants within 5 feet of sample point)

Species	Indicator Status	% cover (estimate)
1. Lolium perenne	1. FAC	1. 50
2. Bromus mollis	2. FACU	2. 40
3. Cordylanthus tenuis	3. UPL	3. 5
4.	4.	4.
5.	5.	5.

B. Shrubs/saplings (3 to 5 dominants within 5 feet of sample point)

Species	Indicator Status	% cover (estimate)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.
5.	5.	5.

C. Trees/woody vines (3 to 5 dominants within 30 feet of sample point)

Species	Indicator Status	% cover (estimate)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.
5.	5.	5.

If any species show the following characteristics, place the corresponding letter in the "indicator status" column: A buttressed trunks. B pnuematophores. C adventitious roots. D shallow root systems. E aerenchymous roots, stems or leaves. F polymorphic leaves. G floating leaves or stems. H others (specify____

Summary: % of wetland species ____ % cover by wetland species (estimate) ____

Transect and Plot # 12 Date 7/9 Investigator S. LOHMANN

SOILS

Yes	No	
		Texture @ 10 inches depth: X non-sandy ___ sandy
		SCS Series mapped: HILLGATE SILT LOAM
X	___	Is matrix chroma ≤ 1? Matrix color: 10 YR 3/1, 10 YR 2/1
X	___	If mottled, matrix chroma ≤ 2? Mottled (orange/red or grey) Y If yes, depth range SURF. Col: 7.5 YR 3/2

All soil textures (complete regardless of texture)

Yes	No	
___	X	Soil saturated at or near surface all of the year? (peraquic moisture regime)
X	___	Aquic moisture regime at suborder level?
___	X	Sulfidic odor? If yes, depth? ___
___	X	Histic epipedon: >30% organic in an 8-16" layer near soil surface (> 20% in sandy soil)

Non-sandy soils (do not complete if soil is sandy)

Yes	No	
___	X	Organic soil (Histosols): >50% in top 32"?
___	X	Gleyed? If yes, predominant color(s) ___ ___ mottled ___ depth range ___ continuous ___ range
___	X	Fe or Mn concretions >2mm diameter within 3" of surface?

Sandy soils (complete only if texture is sandy)

Yes	No	
___	___	Organic pan? If yes, depth ___
___	___	Vertical dark organic streaks (may stain fingers)
X	___	**Summary:** Hydric soil?

HYDROLOGY

Yes	No	
___	✓	Inundated? If yes, depth ___
___	✓	Water table encountered? If yes, depth to water table ___
___	✓	Can water be squeezed or shaken from the surface soil?
___	✓	Algal mats present?
___	✓	Oxidized rhizospheres
___	✓	Sulfidic odor? If yes, depth ___
___	✓	Aerenchyma tissue, drop roots, pneumatophores, hypertrophied lenticels, or floating stems or leaves
___	✓ *	Channels or other indicators of flow patterns observable?
___	✓ *	Drift/debris lines present?
___	✓ *	Watermarks or sediment on vegetation, detritus, structures?
___	✓ *	Shallow root systems, adventitious roots?

*Secondary indicator

Yes	No	
X	___	**Summary:** Wetland hydrologic regime? HOOFPRINTS IN SWALE BOTTOM

Notes: JURISDICTIONAL WETLANDS

WETLAND DETERMINATION (ROUTINE)

Project: LION'S GATE Plot# 12 Elevation ______
Adjacent waterbody: ______ Location: ______

TYPICAL/ATYPICAL/MAN-INDUCED DETERMINATION

Has vegetation been significantly altered by man? ___ yes X no
Has soil been significantly altered by man? ___ yes X no
Has hydrologic regime been significantly altered by man? ___ yes X no
(Include notes for any yes answers to above, including description of change and estimated date of change)

VEGETATION Estimated total vegetative cover: 100

A. Forbs (3 to 5 dominants within 5 feet of sample point)

Species	Indicator Status	% cover (estimate)
1. CYONODON DACTYLIS	1. FAC	1. 45
2. LYTHRUM HYSSOPIFOLIA	2. FACW	2. 30
3.	3.	3.
4.	4.	4.
5.	5.	5.

B. Shrubs/saplings (3 to 5 dominants within 5 feet of sample point)

Species	Indicator Status	% cover (estimate)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.
5.	5.	5.

C. Trees/woody vines (3 to 5 dominants within 30 feet of sample point)

Species	Indicator Status	% cover (estimate)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.
5.	5.	5.

If any species show the following characteristics, place the corresponding letter in the "indicator status" column: A buttressed trunks, B pnuematophores, C adventitious roots, D shallow root systems, E aerenchymous roots, stems or leaves, F polymorphic leaves, G floating leaves or stems, H others (specify ______)

Summary: % of wetland species ____ % cover by wetland species (estimate) ___

Transect and Plot # 13 Date 7/9 Investigator S. LOHMANN

SOILS

Yes	No	
		Texture @ 10 inches depth: X non-sandy ___ sandy
		SCS Series mapped: KEEFERS
___	X	Is matrix chroma ≤ 1? Matrix color 7.5 YR 3/3
___	X	If mottled, matrix chroma ≤ 2? Mottled (orangered or grey) NO If yes, depth range ___ Color

All soil textures (complete regardless of texture)

Yes	No	
___	X	Soil saturated at or near surface all of the year? (peraquic moisture regime)
___	X	Aquic moisture regime at suborder level?
___	X	Sulfidic odor? If yes, depth? ___
___	X	Histic epipedon: >30% organic in an 8-16" layer near soil surface (> 20% in sandy soil)

Non-sandy soils (do not complete if soil is sandy)

Yes	No	
___	X	Organic soil (Histosols: >50% in top 32")?
___	X	Gleyed? If yes, predominant colors ___ ___ mottled ___ depth range ___ continuous ___ range
___	X	Fe or Mn concretions >2mm diameter within 3" of surface?

Sandy soils (complete only if texture is sandy)

Yes	No	
___	___	Organic pan? If yes, depth ___
___	___	Vertical dark organic streaks (may stain fingers)
___	X	Summary: Hydric soil?

HYDROLOGY

Yes	No	
___	X	Inundated? If yes, depth ___
___	X	Water table encountered? If yes, depth to water table ___
___	X	Can water be squeezed or shaken from the surface soil?
___	X	Algal mats present?
___	X	Oxidized rhizospheres
___	X	Sulfidic odor? If yes, depth ___
___	X	Aerenchyma tissue, prop roots, pneumatophores, hypertrophied lenticels, or floating stems or leaves
___	X	Channels or other indicators of flow patterns observable?*
___	X	Drift/debris lines present?*
___	X	Watermarks or sediment on vegetation, debris, structures?*
___	X	Shallow root systems, adventitious roots?*

*Secondary indicator

Yes	No	
___	X	Summary: Wetland hydrologic regime?

Notes: NON-WETLAND

WETLAND DETERMINATION (ROUTINE)

Project: Lion's Gate Plot: 13 Elevation: ______
Adjacent waterbody: ______ Location: ______

TYPICAL/ATYPICAL/MAN-INDUCED DETERMINATION

Has vegetation been significantly altered by man? ___ yes X no
Has soil been significantly altered by man? ___ yes X no
Has hydrologic regime been significantly altered by man? ___ yes X no
(Include notes for any yes answers to above, including description of change and estimated data of change)

VEGETATION Estimated total vegetative cover: ______

A. Forbs (3 to 5 dominants within 5 feet of sample point)

Species	Indicator Status	% cover (estimate)
1. Lolium perenne	1. FAC	1. 60
2. Avena sp.	2. UPl	2. 20
3.	3.	3.
4.	4.	4.
5.	5.	5.

B. Shrubs/saplings (3 to 5 dominants within 5 feet of sample point)

Species	Indicator Status	% cover (estimate)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.
5.	5.	5.

C. Trees/woody vines (3 to 5 dominants within 30 feet of sample point)

Species	Indicator Status	% cover (estimate)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.
5.	5.	5.

If any species show the following characteristics, place the corresponding letter in the "indicator status" column: A buttressed trunks. B pneumatophores. C adventitious roots. D shallow root systems. E aerenchymous roots. stems or leaves. F polymorphic leaves. G floating leaves or stems. H others (specify ______

Summary: % of wetland species ____ % cover by wetland species (estimate) ____

Transect and Plot # 14 Date 7/9 Investigator S. LOHMANN

SOILS

Yes	No	
		Texture @ 10 inches depth: X non-sandy ___ sandy
		SCS Series mapped: HILLGATE
X	___	Is matrix chroma ≤ 1? Matrix color 10 YR 2/1
X	___	If mottled, matrix chroma ≤ 2? Mottled (orange/red or grey) ___ If yes, depth range ^ Color 10 YR 3/3

All soil textures (complete regardless of texture)

Yes	No	
___	X	Soil saturated at or near surface all of the year? (peraquic moisture regime)
X	___	Aquic moisture regime at suborder level?
___	X	Sulfidic odor? If yes, depth? ___
___	X	Histic epipedon: >30% organic in an 8-16" layer near soil surface (> 20% in sandy soil)

Non-sandy soils (do not complete if soil is sandy)

Yes	No	
___	X	Organic soil (Histosols): >50% in top 32"?
___	X	Gleyed? If yes, predominant color(s) ___ ___ mottled ___ depth range ___ continuous ___ range
___	X	Fe or Mn concretions >2mm diameter within 3" of surface?

Sandy soils (complete only if texture is sandy)

Yes	No	
___	___	Organic pan? If yes, depth ___
___	___	Vertical dark organic streaks (may stain fingers)
X	___	Summary: Hydric soil?

DEEPLY CRACKED

HYDROLOGY

Yes	No	
___	___	Inundated? If yes, depth ___
___	___	Water table encountered? If yes, depth to water table ___
___	___	Can water be squeezed or shaken from the surface soil?
___	___	Algal mats present?
___	___	Oxidized rhizospheres
___	___	Sulfidic odor? If yes, depth ___
___	___	Aerenchyma tissue, prop roots, pneumatophores, hypertrophied lenticels, or floating stems or leaves
___	___*	Channels or other indicators of flow patterns observable?
___	___*	Drift/debris lines present?
___	___*	Watermarks or sediment on vegetation, detritus, structures?
___	___*	Shallow root systems, adventitious roots?

*Secondary indicator

SITE LOCATED IN SWALE

Yes	No	
X	___	Summary: Wetland hydrologic regime?

Notes: JURISDICTIONAL WETLAND

WETLAND DETERMINATION (ROUTINE)

Project: Lion's Gate Plot# 14 Elevation ____
Adjacent waterbody: ____ Location: ____

TYPICAL/ATYPICAL/MAN-INDUCED DETERMINATION

Has vegetation been significantly altered by man? ___ yes X no
Has soil been significantly altered by man? ___ yes X no
Has hydrologic regime been significantly altered by man? ___ yes X no
(Include notes for any yes answers to above, including description of change and estimated date of change)

VEGETATION Estimated total vegetative cover: 100%

A. Forbs (3 to 5 dominants within 5 feet of sample point)

Species	Indicator Status	% cover (estimate)
1. Lolium Perenne	1. FAC	1. 75
2. Cordylanthus tenuis	2. UPL	2. 15
3.	3.	3.
4.	4.	4.
5.	5.	5.

B. Shrubs/saplings (3 to 5 dominants within 5 feet of sample point)

Species	Indicator Status	% cover (estimate)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.
5.	5.	5.

C. Trees/woody vines (3 to 5 dominants within 30 feet of sample point)

Species	Indicator Status	% cover (estimate)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.
5.	5.	5.

If any species show the following characteristics, place the corresponding letter in the "indicator status" column: A buttressed trunks. B pnuematophores. C adventitious roots. D shallow root systems. E aerenchymous roots, stems or leaves. F polymorphic leaves. G floating leaves or stems. H others (specify ____)

Summary: % of wetland species ____ % cover by wetland species (estimate) ____

Transect and Plot # 15 Date 7/9 Investigator S. LOHMANN

SOILS

Yes No

Texture @ 10 inches depth: X non-sandy ___ sandy

SCS Series mapped: KEEFERS

___ X Is matrix chroma ≤ 1? Matrix color 7.5 YR 3/3

___ X If mottled, matrix chroma ≤ 2? Mottled (orange/red or grey) NO If yes, depth range___ Color

All soil textures (complete regardless of texture)

___ X Soil saturated at or near surface all of the year? (peraquic moisture regime)

___ X Aquic moisture regime at suborder level?

___ X Sulfidic odor? If yes, depth? ___

___ X Histic epipedon: >30% organic in an 8-16" layer near soil surface (> 20% in sandy soil)

Non-sandy soils (do not complete if soil is sandy)

___ X Organic soil (Histosols): >50% in top 32"?

___ X Gleyed? If yes, predominant color(s) ___ ___ mottled ___ depth range ___ continuous ___ range

___ X Fe or Mn concretions >2mm diameter within 3" of surface?

Sandy soils (complete only if texture is sandy)

___ ___ Organic pan? If yes, depth ___

___ ___ Vertical dark organic streaks (may stain fingers)

___ X Summary: Hydric soil?

HYDROLOGY

Yes No

___ X Inundated? If yes, depth ___

___ X Water table encountered? If yes, depth to water table ___

___ X Can water be squeezed or shaken from the surface soil?

___ X Algal mats present?

___ X Oxidized rhizospheres

___ X Sulfidic odor? If yes, depth ___

___ X Aerenchyma tissue, prop roots, pneumatophores, hypertrophied lenticels, or floating stems or leav

___ X Channels or other indicators of flow patterns observable?*

___ X Drift/debris lines present?*

___ X Watermarks or sediment on vegetation, detritus, structures?*

___ X Shallow root systems, adventitious roots?*

*Secondary indicator

___ X Summary: Wetland hydrologic regime?

Notes: NON-WETLAND

WETLAND DETERMINATION (ROUTINE)

Project: LION'S GATE Plot# 15 Elevation ______
Adjacent waterbody: ______ Location: ______

TYPICAL/ATYPICAL/MAN-INDUCED DETERMINATION

Has vegetation been significantly altered by man? ___ yes X no
Has soil been significantly altered by man? ___ yes X no
Has hydrologic regime been significantly altered by man? ___ yes X no
(Include notes for any yes answers to above, including description of change and estimated date of change)

VEGETATION Estimated total vegetative cover: 100

A. Forbs (3 to 5 dominants within 5 feet of sample point)

Species	Indicator Status	% cover (estimate)
1. Lolium perenne	1. FAC	1. 50
2. Cordylanthus tenuis	2. UPl	2. 25
3.	3.	3.
4.	4.	4.
5.	5.	5.

B. Shrubs/saplings (3 to 5 dominants within 5 feet of sample point)

Species	Indicator Status	% cover (estimate)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.
5.	5.	5.

C. Trees/woody vines (3 to 5 dominants within 30 feet of sample point)

Species	Indicator Status	% cover (estimate)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.
5.	5.	5.

If any species show the following characteristics, place the corresponding letter in the "indicator status" column: A buttressed trunks, B pneumatophores, C adventitious roots, D shallow root systems, E aerenchymous roots, stems or leaves, F polymorphic leaves, G floating leaves or stems, H others (specify ______

Summary: % of wetland species ___ % cover by wetland species (estimate) ___

Transect and Plot # 16 Date 7/9 Investigator S. LOHMANN

SOILS

Yes	No	
		Texture @ 10 inches depth: X non-sandy ___ sandy
		SCS Series mapped: HILLGATE
X		Is matrix chroma ≤ 1? Matrix color 10YR 2/1
X		If mottled, matrix chroma ≤ 2? Mottled (orange/red or grey) Yes If yes, depth range 3" + Color 10YR 3/2

All soil textures (complete regardless of texture)

Yes	No	
	X	Soil saturated at or near surface all of the year? (peraquic moisture regime)
X		Aquic moisture regime at suborder level?
	X	Sulfidic odor? If yes, depth? ______
	X	Histic epipedon: >30% organic in an 8-16" layer near soil surface (> 20% in sandy soil)

Non-sandy soils (do not complete if soil is sandy)

Yes	No	
	X	Organic soil (Histosols): >50% in top 32"?
	X	Gleyed? If yes, predominant color(s) ______ ___ mottled ___ depth range ___ continuous ___ range
	✓	Fe or Mn concretions >2mm diameter within 3" of surface?

Sandy soils (complete only if texture is sandy)

Yes	No	
		Organic pan? If yes, depth ___
		Vertical dark organic streaks (may stain fingers)

Yes	No	
X		**Summary:** Hydric soil?

HYDROLOGY

Yes	No	
		Inundated? If yes, depth ______
		Water table encountered? If yes, depth to water table ______
		Can water be squeezed or shaken from the surface soil?
		Algal mats present?
		Oxidized rhizospheres
		Sulfidic odor? If yes, depth ______
		Aerenchyma tissue, drop roots, pneumatophores, hypertrophied lenticels, or floating stems or leav
		Channels or other indicators of flow patterns observable?*
		Drift/debris lines present?*
		Watermarks or sediment on vegetation, detritus, structures?*
		Shallow root systems, adventitious roots?*

*Secondary indicator

Yes	No	
X		**Summary:** Wetland hydrologic regime? HYDROLOGY ASSUMED DUE TO HYDROPHYTIC VEGETATION AND HYDRIC SOILS

Notes: JURISDICTIONAL WETLAND

WETLAND DETERMINATION (ROUTINE)

Project: Lion's Gate Plot# 16 Elevation ______
Adjacent waterbody: ______ Location: ______

TYPICAL/ATYPICAL/MAN-INDUCED DETERMINATION

Has vegetation been significantly altered by man? ___yes X no
Has soil been significantly altered by man? ___yes X no
Has hydrologic regime been significantly altered by man? ___yes X no
(Include notes for any yes answers to above, including description of change and estimated date of change)

VEGETATION Estimated total vegetative cover: 100

A. Forbs (3 to 5 dominants within 5 feet of sample point)

Species	Indicator Status	% cover (estimate)
1. Lythrum hyssopifolia	1. FACW	1. 45
2. Hordeum hystrix	2. FAC	2. 30
3.	3.	3.
4.	4.	4.
5.	5.	5.

B. Shrubs/saplings (3 to 5 dominants within 5 feet of sample point)

Species	Indicator Status	% cover (estimate)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.
5.	5.	5.

C. Trees/woody vines (3 to 5 dominants within 30 feet of sample point)

Species	Indicator Status	% cover (estimate)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.
5.	5.	5.

If any species show the following characteristics, place the corresponding letter in the "indicator status" column: A buttressed trunks, B pnuematophores, C adventitious roots, D shallow root systems, E aerenchymous roots, stems or leaves, F polymorphic leaves, G floating leaves or stems, H others (specify ______)

Summary: % of wetland species ____ % cover by wetland species (estimate) ____

Transect and Plot # 17 Date 7/9 Investigator S. LOHMANN

SOILS

89' FROM POND EDGE

Yes	No	
		Texture @ 10 inches depth: X non-sandy ___ sandy
		SCS Series mapped: KEEFERS
X	___	Is matrix chroma ≤ 1? Matrix color 10 YR 2/1
___	X	If mottled, matrix chroma ≤ 2? Mottled (orange/red or grey) ___ If yes, depth range ___ Col

All soil textures (complete regardless of texture)

Yes	No	
___	X	Soil saturated at or near surface all of the year? (peraquic moisture regime)
___	X	Aquic moisture regime at suborder level?
___	X	Sulfidic odor? If yes, depth? ___
___	X	Histic epipedon: >30% organic in an 8-16" layer near soil surface (> 20% in sandy soil)

Non-sandy soils (do not complete if soil is sandy)

Yes	No	
___	X	Organic soil (Histosols): >50% in top 32"?
___	X	Gleyed? If yes, predominant colors ___ ___ mottled ___ depth range ___ continuous ___ range
___	X	Fe or Mn concretions >2mm diameter within 3" of surface?

Sandy soils (complete only if texture is sandy)

Yes	No	
___	___	Organic pan? If yes, depth ___
___	___	Vertical dark organic streaks (may stain fingers)
___	X	Summary: Hydric soil?

HYDROLOGY

Yes	No	
___	___	Inundated? If yes, depth ___
___	___	Water table encountered? If yes, depth to water table ___
___	___	Can water be squeezed or shaken from the surface soil?
___	___	Algal mats present?
___	___	Oxidized rhizospheres
___	___	Sulfidic odor? If yes, depth ___
___	___	Aerenchyma tissue, prop roots, pneumatophores, hypertrophied lenticels, or floating stems or lea
___	___ *	Channels or other indicators of flow patterns observable?
___	___ *	Drift/debris lines present?
___	___ *	Watermarks or sediment on vegetation, detritus, structures?
___	___ *	Shallow root systems, adventitious roots?

*Secondary indicator

Yes	No	
___	X	Summary: Wetland hydrologic regime?

Notes: NON-WETLAND
24"

WETLAND DETERMINATION (ROUTINE)

Project: Lions Gate Plot# 17 Elevation ____
Adjacent waterbody: ____ Location: ____

TYPICAL/ATYPICAL/MAN-INDUCED DETERMINATION

Has vegetation been significantly altered by man? ___yes X no
Has soil been significantly altered by man? ___yes X no
Has hydrologic regime been significantly altered by man? ___yes X no
(Include notes for any yes answers to above, including description of change and estimated date of change)

VEGETATION Estimated total vegetative cover: ____

A. Forbs (3 to 5 dominants within 5 feet of sample point)

Species	Indicator Status	% cover (estimate)
1. Lolium Perenne	1. FAC	1. 60
2. Cordylanthus tenuis	2. UPl	2. 20
3. Centaurea solstitialis	3. UPl	3. 10
4.	4.	4.
5.	5.	5.

B. Shrubs/saplings (3 to 5 dominants within 5 feet of sample point)

Species	Indicator Status	% cover (estimate)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.
5.	5.	5.

C. Trees/woody vines (3 to 5 dominants within 30 feet of sample point)

Species	Indicator Status	% cover (estimate)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.
5.	5.	5.

If any species show the following characteristics, place the corresponding letter in the "indicator status" column: A buttressed trunks. B pnuematophores. C adventitious roots. D shallow root systems. E aerenchymous roots, stems or leaves. F polymorphic leaves. G floating leaves or stems. H others (specify____________________)

Summary: % of wetland species ____ % cover by wetland species (estimate) ____

Transect and Plot # 18   Date 7/9   Investigator S. LOHMANN

SOILS

Yes	No	
		Texture @ 10 inches depth: X non-sandy ___ sandy
		SCS Series mapped: KEEFERS
X	___	Is matrix chroma ≤ 1? Matrix color 10 YR 2/1
X	___	If mottled, matrix chroma ≤ 2? Mottled (orange/red or grey) Y If yes, depth range ___ Color 10 YR 3/2

All soil textures (complete regardless of texture)

Yes	No	
___	X	Soil saturated at or near surface all of the year? (peraquic moisture regime)
X	___	Aquic moisture regime at suborder level?
___	X	Sulfidic odor? If yes, depth? ___
___	X	Histic epipedon: >30% organic in an 8-16" layer near soil surface (> 20% in sandy soil)

Non-sandy soils (do not complete if soil is sandy)

Yes	No	
___	X	Organic soil (Histosols: >50% in top 32")?
X	___	Gleyed? If yes, predominant colors 5Y 4/1 X mottled 16"+ depth range ___ continuous ___ range
___	X	Fe or Mn concretions >2mm diameter within 3" of surface? Mn NODULES 15" +

Sandy soils (complete only if texture is sandy)

Yes	No	
___	___	Organic pan? If yes, depth ___
___	___	Vertical dark organic streaks (may stain fingers)
X	___	Summary: Hydric soil?

HYDROLOGY

Yes	No	
___	___	Inundated? If yes, depth ___
___	___	Water table encountered? If yes, depth to water table ___
___	___	Can water be squeezed or shaken from the surface soil?
___	___	Algal mats present?
___	___	Oxidized rhizospheres
___	___	Sulfidic odor? If yes, depth ___
___	___	Aerenchyma tissue, drop roots, pneumatophores, hypertrophied lenticels, or floating stems or leav
___	___	*Channels or other indicators of flow patterns observable?
___	___	*Drift/debris lines present?
___	___	*Watermarks or sediment on vegetation, detritus, structures?
___	___	*Shallow root systems, adventitious roots?

*Secondary indicator

Yes	No	
X	___	Summary: Wetland hydrologic regime? HyDrology ASSUMED DUE TO PRESE OF HYDRIC SOILS AND HYDROPHYTIC VEGETAT.

Notes:

WETLAND DETERMINATION (ROUTINE)

Project: Lion's Gate Plot: 18 Elevation: ____
Adjacent waterbody: ____ Location: ____

TYPICAL/ATYPICAL/MAN-INDUCED DETERMINATION

Has vegetation been significantly altered by man? ___ yes X no
Has soil been significantly altered by man? ___ yes X no
Has hydrologic regime been significantly altered by man? ___ yes X no
(Include notes for any yes answers to above, including description of change and estimated date of change)

VEGETATION Estimated total vegetative cover: 100%

A. Forbs (3 to 5 dominants within 5 feet of sample point)

Species	Indicator Status	% cover (estimate)
1. Hordeum hystrix	1. FAC	1. 50
2. Lolium perenne	2. FAC	2. 35
3. Cordylanthus tenuis	3. UPL	3. 8
4.	4.	4.
5.	5.	5.

B. Shrubs/saplings (3 to 5 dominants within 5 feet of sample point)

Species	Indicator Status	% cover (estimate)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.
5.	5.	5.

C. Trees/woody vines (3 to 5 dominants within 30 feet of sample point)

Species	Indicator Status	% cover (estimate)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.
5.	5.	5.

If any species show the following characteristics, place the corresponding letter in the "indicator status" column: A buttressed trunks. B pneumatophores. C adventitious roots. D shallow root systems. E aerenchymous roots. stems or leaves. F polymorphic leaves. G floating leaves or stems. H others (specify ____

Summary: % of wetland species ____ % cover by wetland species (estimate) ____

Transect and Plot # 19 Date 7/9 Investigator S. LOHMANN

SOILS

Yes	No	
		Texture @ 10 inches depth: X non-sandy ___ sandy
		SCS Series mapped: KEEFERS
X	___	Is matrix chroma ≤ 1? Matrix color 10 YR 3/1
X	___	If mottled, matrix chroma ≤ 2? Mottled (orange/red or grey) YES If yes, depth range ____ Color

All soil textures (complete regardless of texture)

Yes	No	
___	X	Soil saturated at or near surface all of the year? (peraquic moisture regime)
X	___	Aquic moisture regime at suborder level?
___	X	Sulfidic odor? If yes, depth? ________
___	X	Histic epipedon: >30% organic in an 8-16" layer near soil surface (> 20% in sandy soil)

Non-sandy soils (do not complete if soil is sandy)

Yes	No	
___	X	Organic soil (Histosols): >50% in top 32"?
___	X	Gleyed? If yes, predominant color(s) ________ ___ mottled ____ depth range ____ continuous ___ range
___	X	Fe or Mn concretions >2mm diameter within 3" of surface?

Sandy soils (complete only if texture is sandy)

Yes	No	
___	___	Organic pan? If yes, depth ____
___	___	Vertical dark organic streaks (may stain fingers)
X	___	Summary: Hydric soil?

HYDROLOGY

Yes	No	
___	X	Inundated? If yes, depth ____
___	X	Water table encountered? If yes, depth to water table ____
___	X	Can water be squeezed or shaken from the surface soil?
___	X	Algal mats present?
X	___	Oxidized rhizospheres
___	X	Sulfidic odor? If yes, depth ______
___	X	Aerenchyma tissue, prop roots, pneumatophores, hypertrophied lenticels, or floating stems or leaves
___	X*	Channels or other indicators of flow patterns observable?
___	X*	Drift/debris lines present?
X	___	Watermarks or sediment on vegetation, debris, structures?
___	X*	Shallow root systems, adventitious roots?

*Secondary indicator

Yes	No	
X	___	Summary: Wetland hydrologic regime?

Notes: JURISDICTIONAL WETLAND

WETLAND DETERMINATION (ROUTINE)

Project: LION'S GATE Plot: 19 Elevation: ____
Adjacent waterbody: ____ Location: ____

TYPICAL/ATYPICAL/MAN-INDUCED DETERMINATION

Has vegetation been significantly altered by man? ___ yes ✓ no
Has soil been significantly altered by man? ___ yes X no
Has hydrologic regime been significantly altered by man? ___ yes ✓ no
(Include notes for any yes answers to above, including description of change and estimated date of change)

VEGETATION Estimated total vegetative cover: 85

A. Forbs (3 to 5 dominants within 5 feet of sample point)

Species	Indicator Status	% cover (estimate)
1. POLYGONUM AVICULARE	1. FAC	1. [illegible]
2. EPILOBIUM DENSIFLORUM	2. OBL	2. 25
3. ELEOCHARIS SP.	3. FACW or OBL	3. 7
4. POLYPOGON MONSPELIENSIS	4. FACW	4. 12
5.	5.	5.

B. Shrubs/saplings (3 to 5 dominants within 5 feet of sample point)

Species	Indicator Status	% cover (estimate)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.
5.	5.	5.

C. Trees/woody vines (3 to 5 dominants within 30 feet of sample point)

Species	Indicator Status	% cover (estimate)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.
5.	5.	5.

If any species show the following characteristics, place the corresponding letter in the "indicator status" column: A buttressed trunks. B pneumatophores. C adventitious roots. D shallow root systems. E aerenchymous roots, stems or leaves. F polymorphic leaves. G floating leaves or stems. H others (specify ____)

Summary: % of wetland species ____ % cover by wetland species (estimate) ____

Transect and Plot # 20 Date 7/9 Investigator S. LOHMANN

SOILS

Yes	No	
		Texture @ 10 inches depth: X non-sandy ___ sandy
		SCS Series mapped: KEEFERS
___	X	Is matrix chroma ≤ 1? Matrix color 7.5 YR 3/2
X	___	If mottled, matrix chroma ≤ 2? Mottled (orange/red or grey) YES If yes, depth range SURFACE Color RED

All soil textures (complete regardless of texture)

Yes	No	
___	X	Soil saturated at or near surface all of the year? (peraquic moisture regime)
X	___	Aquic moisture regime at suborder level?
___	X	Sulfidic odor? If yes, depth? ________
___	X	Histic epipedon: >30% organic in an 8-16" layer near soil surface (> 20% in sandy soil)

Non-sandy soils (do not complete if soil is sandy)

Yes	No	
___	X	Organic soil (Histosols): >50% in top 32"?
___	X	Gleyed? If yes, predominant color(s) ________ ___ mottled ___ depth range ___ continuous ___ range
___	X	Fe or Mn concretions >2mm diameter within 3" of surface?

Sandy soils (complete only if texture is sandy)

Yes	No	
___	___	Organic pan? If yes, depth ____
___	___	Vertical dark organic streaks (may stain fingers)

Yes	No	
X	___	Summary: Hydric soil?

HYDROLOGY

Yes	No	
___	|	Inundated? If yes, depth ____
___	|	Water table encountered? If yes, depth to water table ____
___	|	Can water be squeezed or shaken from the surface soil?
___	___	Algal mats present?
X	___	Oxidized rhizospheres
___	|	Sulfidic odor? If yes, depth ____
___	|	Aerenchyma tissue, prop roots, pneumatophores, hypertrophied lenticels, or floating stems or leav
___	|	Channels or other indicators of flow patterns observable?*
___	|	Drift/debris lines present?*
___	___	Watermarks or sediment on vegetation, detritus, structures?*
___	___	Shallow root systems, adventitious roots?*

*Secondary indicator

Yes	No	
X	___	Summary: Wetland hydrologic regime?

Notes: JURISDICTIONAL WETLAND

WETLAND DETERMINATION (ROUTINE)

Project: Lion's Gate Plot# 20 Elevation ____________
Adjacent waterbody: ______________________ Location: ______________

TYPICAL/ATYPICAL/MAN-INDUCED DETERMINATION

Has vegetation been significantly altered by man? ___yes X no
Has soil been significantly altered by man? ___yes X no
Has hydrologic regime been significantly altered by man? X yes ___ no
(Include notes for any yes answers to above, including description of change and estimated date of change) Northern Berm Dams Swale

VEGETATION Estimated total vegetative cover: 90

A. Forbs (3 to 5 dominants within 5 feet of sample point)

Species	Indicator Status	% cover (estimate)
1. Hordeum hystrix	1. FAC	1. 45
2. Lolium perenne	2. FAC	2. 25
3. Eremocarpus setigerus	3. UPl	3. 5
4. Lythrum hyssopifolia	4. FACW	4. 5
5. Polypogon monspeliensis	5. FACW	5. 5

B. Shrubs/saplings (3 to 5 dominants within 5 feet of sample point)

Species	Indicator Status	% cover (estimate)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.
5.	5.	5.

C. Trees/woody vines (3 to 5 dominants within 30 feet of sample point)

Species	Indicator Status	% cover (estimate)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.
5.	5.	5.

If any species show the following characteristics, place the corresponding letter in the "indicator status" column: A buttressed trunks. B pneumatophores. C adventitious roots. D shallow root systems. E aerenchymous roots. stems or leaves. F polymorphic leaves. G floating leaves or stems. H others (specify_______________________________)

Summary: % of wetland species ____ % cover by wetland species (estimate) __

Transect and Plot # 21 Date 7/9 Investigator LOHMANN

SOILS

Yes	No	
		Texture @ 10 inches depth: X non-sandy ___ sandy
		SCS Series mapped: CROPLEY CLAY
X	___	Is matrix chroma ≤ 1? Matrix color 10 YR 4/1
___	X	If mottled, matrix chroma ≤ 2? Mottled (orange/red or grey) NO If yes, depth range ___ Colo

All soil textures (complete regardless of texture)

Yes	No	
___	X	Soil saturated at or near surface all of the year? (peraquic moisture regime)
___	X	Aquic moisture regime at suborder level?
___	X	Sulfidic odor? If yes, depth? ___
___	X	Histic epipedon: >30% organic in an 8-16" layer near soil surface (> 20% in sandy soil)

Non-sandy soils (do not complete if soil is sandy)

Yes	No	
___	X	Organic soil (Histosols): >50% in top 32"?
___	X	Gleyed? If yes, predominant colors ___ ___ mottled ___ depth range ___ continuous ___ range
___	X	Fe or Mn concretions >2mm diameter within 3" of surface?

Sandy soils (complete only if texture is sandy)

Yes	No	
___	___	Organic pan? If yes, depth ___
___	___	Vertical dark organic streaks (may stain fingers)

Yes	No	
___	X	Summary: Hydric soil?

HYDROLOGY

Yes	No	
___	X	Inundated? If yes, depth ___
___	X	Water table encountered? If yes, depth to water table ___
___	X	Can water be squeezed or shaken from the surface soil?
___	X	Algal mats present?
___	X	Oxidized rhizospheres
___	X	Sulfidic odor? If yes, depth ___
___	X	Aerenchyma tissue, prop roots, pneumatophores, hypertrophied lenticels, or floating stems or leav
___	X	Channels or other indicators of flow patterns observable?*
___	X	Drift/debris lines present?*
___	X	Watermarks or sediment on vegetation, debris, structures?*
___	X	Shallow root systems, adventitious roots?*

*Secondary indicator

Yes	No	
___	X	Summary: Wetland hydrologic regime?

Notes: NON-WETLAND

WETLAND DETERMINATION (ROUTINE)

Project: LION'S GATE Plot: 21 Elevation ____
Adjacent Waterbody: ____ Location: ____

TYPICAL/ATYPICAL/MAN-INDUCED DETERMINATION

Has vegetation been significantly altered by man? ___ yes X no
Has soil been significantly altered by man? ___ yes X no
Has hydrologic regime been significantly altered by man? X yes ___ no
(Include notes for any yes answers to above, including description of change and estimated date of change)

VEGETATION Estimated total vegetative cover: 100

A. Forbs (3 to 5 dominants within 5 feet of sample point)

Species	Indicator Status	% cover (estimate)
1. HORDEUM HYSTRIX	1. FAC	1. 40
2. LOLIUM PERENNE	2. FAC	2. 50
3.	3.	3.
4.	4.	4.
5.	5.	5.

B. Shrubs/saplings (3 to 5 dominants within 5 feet of sample point)

Species	Indicator Status	% cover (estimate)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.
5.	5.	5.

C. Trees/woody vines (3 to 5 dominants within 30 feet of sample point)

Species	Indicator Status	% cover (estimate)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.
5.	5.	5.

If any species show the following characteristics, place the corresponding letter in the "indicator status" column: A buttressed trunks. B pnuematophores. C adventitious roots. D shallow root systems. E aerenchymous roots, stems or leaves. F polymorphic leaves. G floating leaves or stems. H others (specify ____)

Summary: % of wetland species ____ % cover by wetland species (estimate) __

Transect and Plot # 22 Date 7/9 Investigator S. LOHMANN

SOILS

Yes	No	
		Texture @ 10 inches depth: X non-sandy ___ sandy
		SCS Series mapped: KEEFERS
X	___	Is matrix chroma ≤ 1? Matrix color 10 YR 2/1
X	___	If mottled, matrix chroma ≤ 2? Mottled (orange/red or grey) YES If yes, depth range ___ Color: 10 YR 3/2

All soil textures (complete regardless of texture)

Yes	No	
___	X	Soil saturated at or near surface all of the year? (peraquic moisture regime)
X	___	Aquic moisture regime at subordet level?
___	X	Sulfidic odor? If yes, depth? ___
___	X	Histic epipedon: >30% organic in an 8-16" layer near soil surface (> 20% in sandy soil)

Non-sandy soils (do not complete if soil is sandy)

Yes	No	
___	X	Organic soil (Histosols): >50% in top 32"?
X	___	Gleyed? If yes, predominant colors ___ ___ mottled ___ depth range ___ continuous ___ range
X	___	Fe or Mn concretions >2mm diameter within 3" of surface?

Sandy soils (complete only if texture is sandy)

Yes	No	
		Organic pan? If yes, depth ___
___	___	Vertical dark organic streaks (may stain fingers)
___	___	
X	___	Summary: Hydric soil?

HYDROLOGY

Yes	No	
___	✓	Inundated? If yes, depth ___
___	✓	Water table encountered? If yes, depth to water table ___
___	✓	Can water be squeezed or shaken from the surface soil?
___	✓	Algal mats present?
___	✓	Oxidized rhizospheres
___	✓	Sulfidic odor? If yes, depth ___
___	✓	Aerenchyma tissue, prop roots, pneumatophores, hypertrophied lenticels, or floating stems or leaves
___	✓	Channels or other indicators of flow patterns observable?*
___	✓	Drift/debris lines present?*
___	✓	Watermarks or sediment on vegetation, detritus, structures?*
___	✓	Shallow root systems, adventitious roots?*

*Secondary indicator

X ___ Summary: Wetland hydrologic regime? HYDROLOGY ASSUMED DUE TO HYDROPHYTIC VEGETATION AND HYDRIC SOIL

Notes: JURISDICTIONAL WETLAND

WETLAND DETERMINATION (ROUTINE)

Project: LION'S GATE Plot: 22 Elevation: ______
Adjacent waterbody: ______ Location: ______

TYPICAL/ATYPICAL/MAN-INDUCED DETERMINATION

Has vegetation been significantly altered by man? ___ yes _X_ no
Has soil been significantly altered by man? ___ yes _X_ no
Has hydrologic regime been significantly altered by man? _X_ yes ___ no
(Include notes for any yes answers to above, including description of change and estimated data of change)

VEGETATION Estimated total vegetative cover: 100

A. Forbs (3 to 5 dominants within 5 feet of sample point)

Species	Indicator Status	% cover (estimate)
1. HORDEUM HYSTRIX	1. FAC	1. [illegible]
2. LOLIUM PERENNE	2. FAC	2. 40
3.	3.	3.
4.	4.	4.
5.	5.	5.

B. Shrubs/saplings (3 to 5 dominants within 5 feet of sample point)

Species	Indicator Status	% cover (estimate)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.
5.	5.	5.

C. Trees/woody vines (3 to 5 dominants within 30 feet of sample point)

Species	Indicator Status	% cover (estimate)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.
5.	5.	5.

If any species show the following characteristics, place the corresponding letter in the "indicator status" column: A buttressed trunks, B pnuematophores, C adventitious roots, D shallow root systems, E aerenchymous roots, stems or leaves, F polymorphic leaves, G floating leaves or stems, H others (specify ______

Summary: % of wetland species ____ % cover by wetland species (estimate) ____

Transect and Plot # 23 Date 7/9 Investigator C LUHMANN

SOILS

Yes	No	
		Texture @ 10 inches depth: ___ non-sandy ___ sandy
		SCS Series mapped: KEEFERS
___	X	Is matrix chroma ≤ 1? Matrix color: 10 YR 3/2
___	X	If mottled, matrix chroma ≤ 2? Mottled (orange/red or grey) NO If yes, depth range ___ Color:

All soil textures (complete regardless of texture)

Yes	No	
___	X	Soil saturated at or near surface all of the year? (peraquic moisture regime)
___	X	Aquic moisture regime at suborder level?
___	X	Sulfidic odor? If yes, depth? ___
___	X	Histic epipedon: >30% organic in an 8-16" layer near soil surface (> 20% in sandy soil)

Non-sandy soils (do not complete if soil is sandy)

Yes	No	
___	X	Organic soil (Histosols): >50% in top 32"?
___	X	Gleyed? If yes, predominant colors ___ ___ mottled ___ depth range ___ continuous ___ range
___	X	Fe or Mn concretions >2mm diameter within 3" of surface?

Sandy soils (complete only if texture is sandy)

Yes	No	
___	___	Organic pan? If yes, depth ___
___	___	Vertical dark organic streaks (may stain fingers)
___	X	Summary: Hydric soil?

HYDROLOGY

Yes	No	
___	X	Inundated? If yes, depth ___
___	X	Water table encountered? If yes, depth to water table ___
___	X	Can water be squeezed or shaken from the surface soil?
___	X	Algal mats present?
___	X	Oxidized rhizospheres
___	X	Sulfidic odor? If yes, depth ___
___	X	Aerenchyma tissue, prop roots, pneumatophores, hypertrophied lenticels, or floating stems or leaves
___	X*	Channels or other indicators of flow patterns observable?
___	X*	Drift/debris lines present?
___	X*	Watermarks or sediment on vegetation, debris, structures?
___	X*	Shallow root systems, adventitious roots?

*Secondary indicator

Yes	No	
___	X	Summary: Wetland hydrologic regime?

Notes: NON-WETLAND

WETLAND DETERMINATION (ROUTINE)

Project: LION'S GATE Plot: 23 Elevation

Adjacent waterbody: Location:

TYPICAL/ATYPICAL/MAN-INDUCED DETERMINATION

Has vegetation been significantly altered by man? ___ yes _X_ no
Has soil been significantly altered by man? ___ yes _X_ no
Has hydrologic regime been significantly altered by man? _X_ yes ___ no
(Include notes for any yes answers to above, including description of change and estimated date of change)

VEGETATION Estimated total vegetative cover: 90

A. Forbs (3 to 5 dominants within 5 feet of sample point)

Species	Indicator Status	% cover (estimate)
1. Lolium perenne	1. FAC	1. 65
2. Hordeum hystrix	2. FAC	2. 16
3. Centaurea solstitialis	3. UPL	3. 10
4.	4.	4.
5.	5.	5.

B. Shrubs/saplings (3 to 5 dominants within 5 feet of sample point)

Species	Indicator Status	% cover (estimate)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.
5.	5.	5.

C. Trees/woody vines (3 to 5 dominants within 30 feet of sample point)

Species	Indicator Status	% cover (estimate)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.
5.	5.	5.

If any species show the following characteristics, place the corresponding letter in the "indicator status" column: A buttressed trunks. B pneumatophores. C adventitious roots. D shallow root systems. E aerenchymous roots, stems or leaves. F polymorphic leaves. G floating leaves or stems. H others (specify

Summary: % of wetland species ___ % cover by wetland species (estimate) ___

APPENDIX 3: SITE PHOTOS

#7: Sample site 6, located adjacent to tributary 3, segment A2-16.

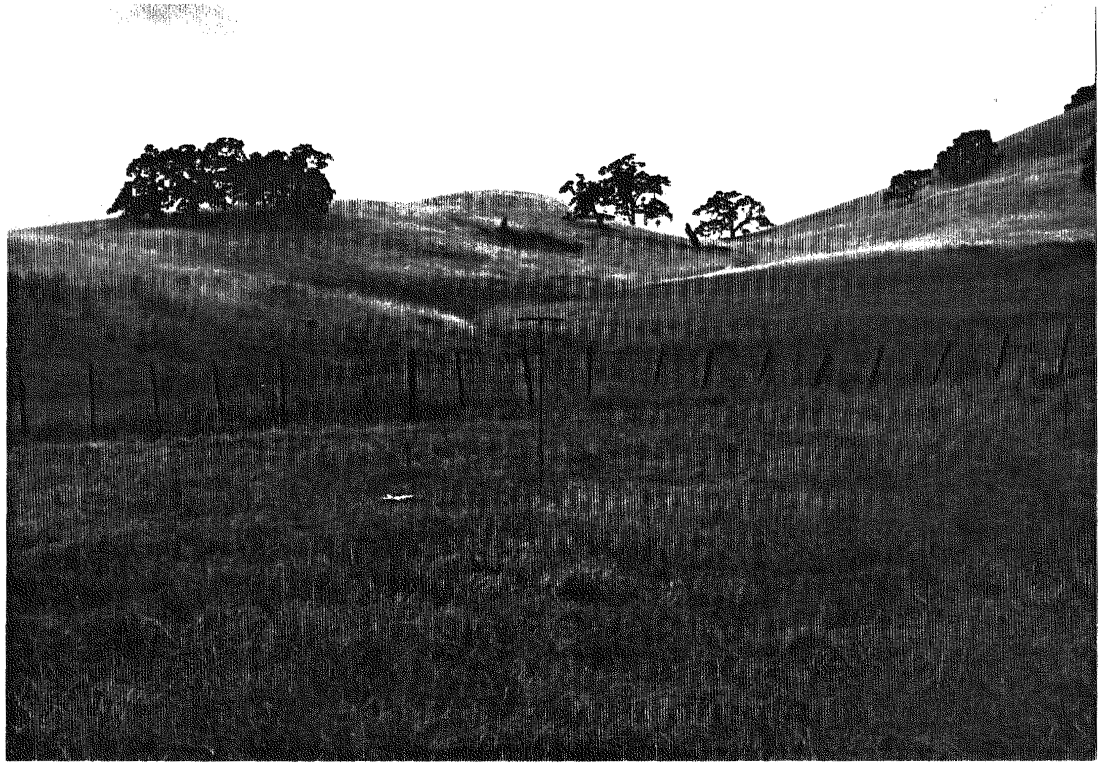
#8: Sample site 8, located adjacent to Llagas Creek, segment A1-18.

06-18-93(HRP201)

LSA

Site Photographs
Sheet 4

#5: Tributary 4, segment A2-24, average width 2 feet.



#6: Sample site 4, located in non-jurisdictional swale west of tributary 2.

06-18-93(HRP201)

LSA

Site Photographs
Sheet 3

#3: West Branch Llagas Creek, segment A1-3, average width 7.5 feet.

#4: Tributary 1, segment A2-3, average width 2 feet.

06-18-93(HRP201)

LSA

Site Photographs
Sheet 2

#1: Center of study area, West Branch Llagas Creek follows toe of slope in background.

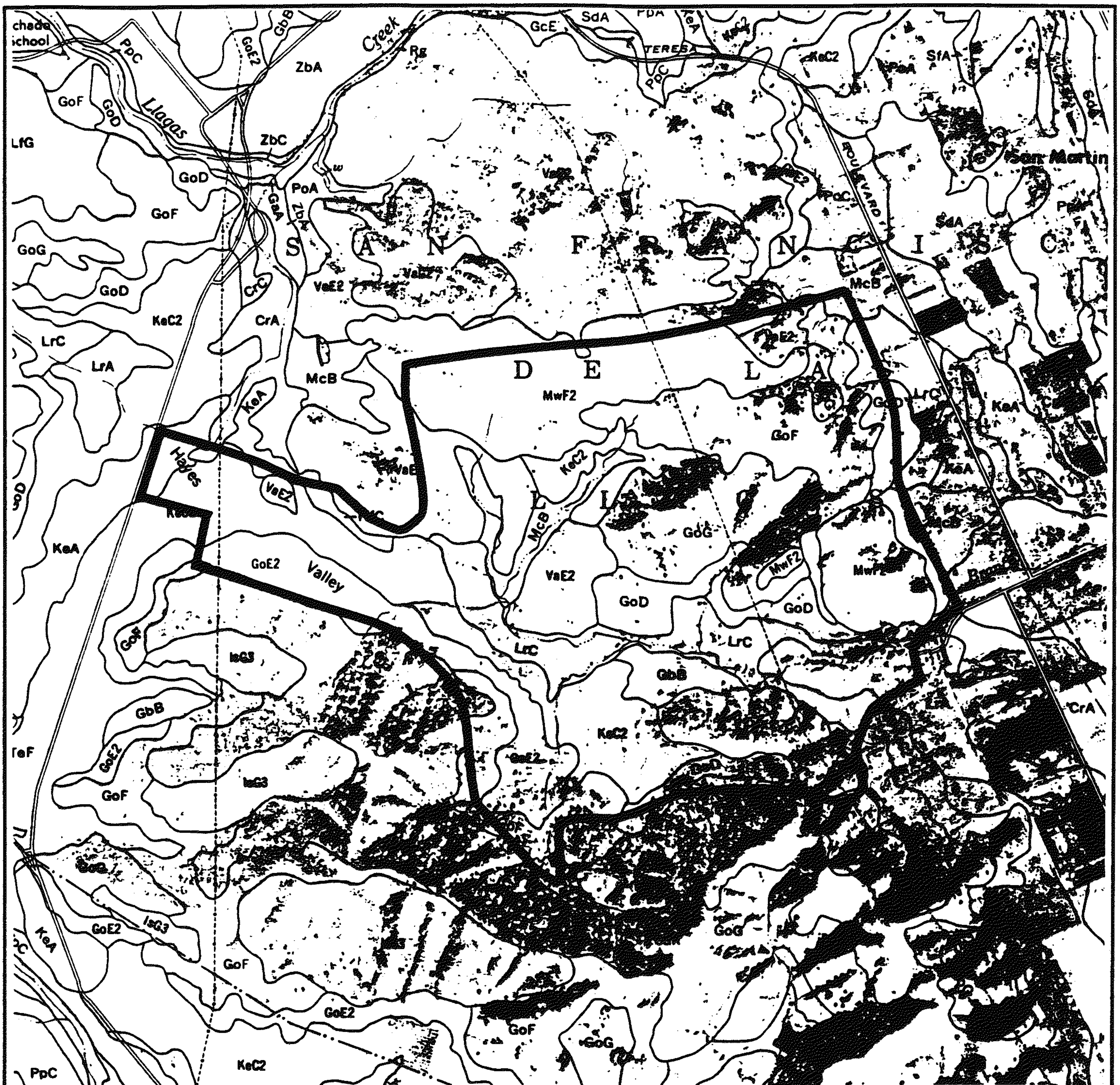
#2: Pond P7

06-18-93(HRP201)

LSA

APPENDIX 4: SCS SOIL MAP AND SERIES DESCRIPTIONS

(Cropley, Garretson, Gilroy, Hillgate, Keefers, Los Robles, Maxwell, Montara and Vallecitos)



Soil Conservation Service Soil Map of Lion's Gate Survey Area

CrA	Cropley clay, 0-2 percent slopes	HfC	Hillgate silt loam, 2-9 percent slopes
GbB	Garretson gravelly loam, 0-5 percent slopes	KeC2	Keefers clay loam, 2-9 percent slopes, eroded
GoD	Gilroy clay loam, 0-30 percent slopes	LrC	Los Robles clay loam. 2-9 percent slopes
GoE2	Gilroy clay loam, 15-30 percent slopes, eroded	McB	Maxwell clay, 0-5 percent slopes
GoF	Gilroy clay loam, 30-50 percent slopes	Mwf2	Montara rocky clay loam, 15-50 percent slopes, eroded
GoG	Gilroy clay loam, 50-75 percent slopes	VaC2	Vallecitos rocky loam, 15-30 percent slopes, eroded

Source: Soil survey of Eastern Santa Clara Area, California; Soil Conservation Service, 1974.

06-11-93(HRP201)

N

LSA

Scale in feet

0 2000

Survey Area Location

This soil is used for dryland pasture and range. Capability unit IVe-5 (15); range site, Clayey.

Cortina Series

The Cortina series consists of somewhat excessively drained, very gravelly loams that are underlain by alluvium from mixed sources. These soils are on stream benches along major drainageways and have slopes of 0 to 5 percent. Vegetation, where these soils are not cultivated, is grasses, forbs, brush, and scattered sycamore and oak trees. Elevation ranges from 100 to 2,400 feet. Average annual rainfall is 16 to 25 inches, and average annual temperature is 58° to 60° F. The growing season is about 250 to 275 days. Cortina soils are associated with the Esparto and Yolo soils.

In a representative profile, the surface layer is pale-brown and brown, slightly acid very gravelly loam and very gravelly fine sandy loam about 28 inches thick. The substratum is pale-brown, slightly acid very gravelly sandy loam to a depth of 60 inches or more.

Cortina soils are used mainly for dryland pasture. A few areas are used for irrigated prunes.

Cortina very gravelly loam, 0 to 5 percent slopes (CoB).—This nearly level to gently sloping soil is on stream benches along major drainageways. It is subject to overflow from adjacent streams.

Representative profile (100 yards south of Isabel Valley Ranch gate on road to China Grade; SW¼SE¼ sec. 14, T. 7 S., R. 4 E.):

A1—0 to 8 inches, pale-brown (10YR 6/3) very gravelly loam containing 60 percent (by volume) medium and fine gravel, dark brown (10YR 4/3) moist; massive; hard, very friable, nonsticky and nonplastic; common very fine roots; many very fine interstitial pores; slightly acid (pH 6.5); clear, smooth boundary. (8 to 12 inches thick.)

IIAb—8 to 28 inches, brown (10YR 5/3) very gravelly fine sandy loam containing 80 percent (by volume) medium and fine gravel, dark brown (10YR 3/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; many very fine interstitial pores and common fine and few medium tubular pores; slightly acid (pH 6.5); abrupt, smooth boundary. (20 to 30 inches thick.)

IIC—28 to 60 inches, pale-brown (10YR 6/3) very gravelly sandy loam containing 90 percent (by volume) medium and fine gravel, dark brown (10YR 4/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; many very fine interstitial pores, common fine tubular pores, and few medium tubular pores; slightly acid (pH 6.5).

The A horizon ranges from brown to grayish brown, pale brown, or light brownish gray. Reaction is slightly acid to neutral in both the A and C horizons. Texture is sandy loam, fine sandy loam, or loam, and these horizons are gravelly or very gravelly. At a depth of 12 to 40 inches, both the A and C horizons are very gravelly sandy loam to very gravelly loam. These soils are subject to flooding, washout, or channeling about three times every 10 years.

Included with this soil in mapping are small areas of Riverwash and Garretson gravelly loam, and small areas that have no gravel in the upper few inches of the surface layer.

This soil has low natural fertility, and available water holding capacity is 2.5 to 4 inches. Permeability is rapid. Runoff is very slow. Effective rooting depth is very deep, but root density is limited by the droughty, very gravelly substratum.

This soil is used mostly for dryland pasture, wildlife, and recreation. A few areas are used for irrigated prunes. Capability units IVw-4 (14) and VIw-4 (15).

Cropley Series

The Cropley series consists of well-drained clays that are underlain by alluvium from mixed sources. These soils lie on fans and terraces and have slopes of 0 to 9 percent. Vegetation, where these soils are not cultivated, is annual grasses, perennial grasses, and forbs. Elevation ranges from 130 to 1,000 feet. Average annual rainfall is 16 to 20 inches, and average annual temperature is about 58° to 60° F. The growing season is about 260 to 275 days. Cropley soils are associated with the Clear Lake and Pleasanton soils.

In a representative profile, the surface layer is very dark gray, neutral to mildly alkaline clay about 36 inches thick. The substratum is a dark grayish-brown, calcareous, moderately alkaline clay to a depth of 60 inches or more. When these soils are dry, deep cracks develop. Slickensides that intersect are present in the surface layer and in the upper part of the substratum.

Cropley soils are used for irrigated row crops, orchards, dryland grain hay, and pasture.

Cropley clay, 0 to 2 percent slopes (CrA).—This soil averages about 1 percent slope and occupies alluvial fans.

Representative profile (in a field 0.2 mile south of Foothill Road from Tennant Avenue intersection and 0.1 mile east):

Ap—0 to 7 inches, very dark gray (10YR 3/1) clay, black (10YR 2/1) moist; weak, medium, subangular blocky structure and strong, medium and fine, granular structure; very hard, very firm, very sticky and very plastic; many very fine roots; many fine and very fine interstitial pores and few medium tubular pores; neutral (pH 7.0); clear, smooth boundary. (5 to 10 inches thick.)

A11—7 to 14 inches, very dark gray (10YR 3/1) clay, black (10YR 2/1) moist; strong, coarse, prismatic structure; very hard, very firm, very sticky and very plastic; few very fine roots and few coarse woody roots; common very fine interstitial pores and few fine tubular pores; small, numerous slickensides on ped surfaces; neutral (pH 7.0); gradual, wavy boundary. (7 to 12 inches thick.)

A12—14 to 36 inches, very dark gray (10YR 3/1) to dark-gray (10YR 4/1) clay, black (10YR 2/1) and very dark gray (10YR 3/1) moist; coarse, strong, prismatic structure; very hard, very firm, very sticky and very plastic; few fine interstitial pores and fine tubular pores; numerous slickensides and pressure cutans on ped surfaces; mildly alkaline (pH 7.5); gradual, wavy boundary. (15 to 30 inches thick.)

Cca—36 to 60 inches, dark grayish-brown (2.5Y 4/2) clay, very dark grayish brown (2.5Y 3/2) moist; massive; hard, firm, sticky and plastic; many, very fine, interstitial pores and common, very fine, tubular pores; calcareous, moderately alkaline (pH 8.0).

The A horizon ranges from dark gray to very dark gray and nearly black. Texture is typically clay but in places is heavy clay loam. Segregated lime is at a depth ranging from 20 to 60 inches but commonly is at about 36 inches. The C horizon is dark grayish brown, grayish brown, or brown. Texture is stratified clay and silty clay loam that averages clay to a depth of more than 40 inches. When this soil is dry, deep cracks develop that range from ½ to 1½ inches in width and extend to an average depth of 36 inches.

Included with this soil in mapping are small areas of Clear Lake clay in low depressions and areas of gravelly clay loam overwash that ranges from 12 to 30 inches in thickness.

The available water holding capacity is 8.5 to 10 inches. Permeability is slow. Runoff is very slow, and the erosion hazard is none to slight. Fertility is high. Effective rooting depth is very deep.

This soil is used for irrigated prunes, apricots, pears, walnuts. row crops, sugar beets, dryland hay, and pasture. Capability unit IIs–5 (14).

Cropley clay, 2 to 9 percent slopes (CrC).—This soil has a profile that is similar to that of Cropley clay, 0 to 2 percent slopes, but slopes average 6 percent.

Included with this soil in mapping are soils that have a gravelly heavy clay loam or gravelly clay texture in the surface layer.

Runoff is slow to medium, and the hazard of erosion is slight to moderate.

This soil is used for irrigated prunes, pears, apricots, walnuts, row crops, dryland hay, and pasture. Capability unit IIe–5 (14).

Diablo Series

The Diablo series consists of well-drained clays that are underlain by fine-grained sandstone at a depth of 26 to 56 inches. These soils are on the uplands and have slopes of 9 to 50 percent. The vegetation, where these soils are not cultivated, is annual grasses and a few scattered oak trees. Elevation ranges from 400 to 2,000 feet. Average annual rainfall is 16 to 20 inches, and average annual temperature is 58° to 60° F. The growing season is about 250 to 275 days. Diablo soils are associated with the Azule and Los Osos soils.

In a representative profile (fig. 3), the surface layer is very dark gray and dark gray, mildly alkaline and moderately alkaline clay about 30 inches thick. The substratum is olive-gray, calcareous, moderately alkaline clay that is underlain at a depth of 40 inches by light olive-gray, soft, calcareous, moderately alkaline, fine-grained sand- soft, calcareous, moderately alkaline, fine-grained sandstone.

Diablo soils are used for dryland grain hay, pasture, and range.

Diablo clay, 9 to 15 percent slopes (DaD).—This soil is on uplands. Average slope is about 12 percent.

Representative profile (1,400 feet up jeep trail off East Fork Coyote Creek toward Rock House Ridge; SW¼NE¼ sec. 31, T. 8 S., R. 5 E.):

A11—0 to 2 inches, very dark gray (10YR 3/1) clay, black (10YR 2/1) moist; strong, medium and fine, subangular blocky structure; very hard, very firm, sticky and very plastic; common fine roots; many very fine interstitial and tubular pores; mildy alkaline (pH 7.6); clear, smooth boundary. (1 to 3 inches thick.)

A12—2 to 20 inches, very dark gray (10YR 3/1) clay, black (10YR 2/1) moist; strong, coarse, angular blocky structure; very hard, very firm, sticky and very plastic; few fine and medium roots; many very fine interstitial pores and few medium tubular pores; common slickensides on ped surfaces, and vertical cracks ¼ to ½ inch wide when dry; mildly alkaline (pH 7.6); clear, wavy boundary. (5 to 20 inches thick.)

A13ca—20 to 30 inches, dark-gray (5Y 4/1) clay, very dark gray (5Y 3/1) moist; strong, coarse, prismatic structure; very hard, very firm, sticky and very plastic; few medium roots; many very fine interstitial and tubular pores and few medium tubular pores; common slickensides on prism surfaces, and vertical cracks ¼ to ½ inch wide when dry; calcareous, moderately alkaline (pH 8.0); diffuse, wavy boundary. (10 to 13 inches thick.)

C—30 to 40 inches, olive-gray (5Y 5/2) clay, dark olive gray (5Y 3/2) moist; moderate, coarse, prismatic structure; very hard, very firm, sticky and very plastic; few medium and coarse roots; many very fine interstitial and tubular pores and few medium tubular pores: calcareous, moderately alkaline (pH 8.4); diffuse, wavy boundary. (10 to 20 inches thick.)

R—40 inches, light olive-gray, soft, calcareous, fine-grained sandstone.

Figure 3.—**Profile of Diablo clay, 9 to 15 percent slopes.**

The A horizon typically is clay but is heavy clay loam or silty clay in places. The C horizon in places is grayish brown, olive gray, or light olive gray. It is moderately calcareous to strongly calcareous and contains lime in soft masses and in seams. Lime is typically present in the lower part of the A horizon or the upper part of the C horizon, but in some places lime occurs at a depth of 10 to 50 inches. When this soil is dry, cracks averaging ¼ to 1½ inches in width develop and extend to an average depth of about 40 inches. Depth to bedrock ranges from 26 to 56 inches and averages about 40 inches.

Included with this soil in mapping are small areas of Climara clay, Los Osos clay loam, areas where lime is absent and the soils have a slightly acid surface layer, a few small areas of severely gullied land, and a few small landslips.

The available water holding capacity of this soil is 3 to 7 inches. Permeability is slow. Runoff is medium to rapid, and the hazard of erosion is moderate to high. Fertility is high. Effective rooting depth is moderately deep to deep.

B1t—2 to 10 inches, brown (7.5YR 5/2) clay loam, dark brown (7.5YR 3/2) moist; moderate, medium, subangular blocky structure; hard, friable, sticky and plastic; common fine roots and few medium roots; many very fine interstitial and tubular pores; common thin clay films on ped surfaces and in pores; medium acid (pH 6.0); clear, wavy boundary. (4 to 9 inches thick.)

B2t—10 to 23 inches, light-brown (7.5YR 6/4) clay loam, brown (7.5YR 5/4) moist; moderate, medium, subangular blocky structure; hard, firm, sticky and plastic; few fine roots and many medium and coarse roots; many very fine interstitial and tubular pores and few, fine, medium, and coarse tubular pores; many thin clay films lining pores and on ped surfaces; medium acid (pH 6.0); clear, wavy boundary. (10 to 14 inches thick.)

B3t—23 to 39 inches, light yellowish-brown (10YR 6/4) clay loam, yellowish brown (10YR 5/6) moist; moderate, medium, subangular blocky structure; hard, firm, sticky and plastic; few medium and coarse roots; many very fine interstitial and tubular pores and few medium and coarse tubular pores; common, thin clay films lining pores and on ped surfaces; strongly acid (pH 5.5); gradual, wavy boundary. (10 to 18 inches thick.)

C1—39 to 48 inches, light yellowish-brown (10YR 6/4) shaly clay loam, about 25 percent (by volume) shale fragments ½ to 1 inch in diameter, yellowish brown (10YR 5/6) moist; weak, medium, subangular blocky structure; hard, firm, sticky and plastic; few medium and coarse roots; many very fine and fine tubular pores and few medium and coarse tubular pores; few thin clay films in pores and on ped surfaces; strongly acid (pH 5.5); gradual, wavy boundary. (9 to 12 inches thick.)

C2—48 inches, interbedded shale and sandstone mixed with yellowish-brown (10YR 5/6) clay loam, dark yellowish brown (10YR 4/4) moist; massive; strongly acid (pH 5.5).

The A horizon commonly is brown or grayish brown, but on concave slopes it is very dark grayish brown in the upper few inches. Texture is silt loam or light silty clay loam. Reaction is slightly acid to medium acid in the A horizon. The B horizon is brown or light brown in the upper part and ranges to very pale brown, light brown, light yellowish brown, and, in a few places, pinkish gray in the lower part. Texture is clay loam or silty clay loam. Depth to the C2 horizon of soft, fine-grained sandstone and shale ranges from 35 to 59 inches.

Included with this soil in mapping are small areas of Ben Lomond sandy loam and, along ridge crests, Madonna loam.

The available water holding capacity of this soil is 6 to 10 inches, depending on the depth of the soil. Permeability in the subsoil is moderately slow. Runoff is very rapid, and the hazard of erosion is very high. Natural fertility is moderate. Effective rooting depth is moderately deep to deep.

This soil is used mainly for timber production, recreation, and watershed. It is moderately productive; site index averages about 130 (*3*). Plant competition is moderate, equipment limitation is severe, seedling mortality is moderate, and windthrow hazard is slight. Capability unit VIIe-1 (4).

Felton silt loam, 15 to 30 percent slopes (FaE).—This soil is on the crests of broad ridges and on footslopes along drainageways. Depth to the substratum is 20 to 36 inches.

Included with this soil in mapping are small areas of Maymen rocky fine sandy loam and areas of moderately eroded and severely eroded soils.

Runoff is medium, and hazard of erosion is moderate. The available water holding capacity is 4 to 7 inches. The effective rooting depth of this soil is moderately deep to sandstone.

Most areas of this soil have been cleared and are used for dryland pasture or grain hay. It is well suited to Christmas tree production. Capability unit IVe-1 (4); range site, Fine Loamy.

Felton silt loam, 30 to 50 percent slopes (FaF).—This soil has an average slope of 40 percent.

Included with this soil in mapping are a few areas of Madonna loam and areas that have been subject to moderate sheet erosion.

This soil is used mainly for the production of timber. A few areas have been cleared and used for range. This soil is moderately productive. Site index averages about 130 (*3*). Seedling mortality is moderate, and windthrow hazard is slight. Because of steep slopes, runoff is rapid and the hazard of erosion is high after areas of this soil have been logged. Capability unit VIe-1 (4); range site, Fine Loamy.

Garretson Series

The Garretson series consists of well-drained loams that are underlain by alluvium from material derived from sedimentary rock. These soils lie on stream benches and fans along drainageways and have slopes of 0 to 5 percent. The vegetation, where these soils are not cultivated, is annual grasses and forbs, and there are a few scattered oak trees. Elevation ranges from 200 to 2,000 feet. Average annual rainfall is 16 to 25 inches, and average annual temperature is 58° to 60° F. The growing season is about 250 to 275 days. Garretson soils are associated with the Esparto, Yolo, and Zamora soils.

In a representative profile, the surface layer is a grayish-brown, neutral loam about 19 inches thick. The substratum is a brown, neutral very fine sandy loam that is underlain at a depth of 40 inches by stratified sand and gravel. In some places the surface layer and substratum are gravelly loam to a depth of 60 inches or more.

Garretson soils are used for irrigated grapes, row crops, orchards, dryland grain hay, and pasture.

Garretson loam, gravel substratum, 0 to 2 percent slopes (GaA).—This soil is on stream benches along the larger drainageways.

Representative profile (in walnut grove, 0.6 mile south of Coyote, 50 feet north off farm road, and 0.2 mile east, off U.S. Highway 101):

Ap—0 to 6 inches, grayish-brown (10YR 5/2) loam containing about 3 to 5 percent (by volume) gravel, very dark grayish brown (10YR 3/2) moist; massive; hard, friable, nonsticky and nonplastic; neutral (pH 7.0); clear, smooth boundary. (4 to 10 inches thick.)

A1—6 to 19 inches, grayish-brown (10YR 5/2) loam containing about 2 to 3 percent medium and fine gravel (by volume), very dark grayish brown (10YR 3/2) moist; massive; hard, friable, nonsticky and nonplastic; many very fine tubular pores and few medium tubular pores; neutral (pH 7.0); clear, smooth boundary. (12 to 18 inches thick.)

C1—19 to 40 inches, brown (10YR 5/3) very fine sandy loam, dark brown (10YR 4/3) moist; massive; hard, friable, nonsticky and nonplastic; neutral (pH 7.0); clear, smooth boundary. (20 to 32 inches thick.)

IIC2—40 to 60 inches, stratified sands and gravels.

The A horizon is brown or grayish brown. Texture typically is loam but in some places is clay loam. Reaction in the A and C horizons is slightly acid or neutral to moderately alkaline. The C1 horizon is brown, pale brown, or yellowish brown. Texture is dominantly very fine sandy loam or loam but in places is gravelly loam, loam, or gravelly clay loam. Clay content of the C1 horizon averages between 18 and 25 percent. Depth to stratified sand and gravel is 36 to 60 inches. The C1 horizon in places is calcareous below 36 inches.

Included with this soil in mapping are some areas of Cortina very gravelly loam and a few areas of soils that have a sand and gravel substratum within 20 inches of the surface.

This soil has about 7.5 to 11 inches of available water holding capacity, the amount depending on depth to sand and gravel. Permeability is moderate in the horizons above the very rapidly permeable gravel. Runoff is slow, and the hazard of erosion is none to slight. Fertility is moderate. Effective rooting depth is very deep.

This soil is used for irrigated apricots, grapes, prunes, row crops, walnuts, and dryland hay and pasture. Capability unit I-1 (14) and IIIc-1 (15).

Garretson gravelly loam, 0 to 5 percent slopes (GbB).—This soil has a profile that is similar to that of Garretson loam, gravel substratum, 0 to 2 percent slopes, but it has more slope in places and the texture is gravelly loam or gravelly clay loam. This soil is 15 to 30 percent gravel to a depth of 60 inches or more.

Included with this soil in mapping are some areas of soils that have slopes of up to 9 percent, and a soil that has a dark grayish-brown, granular surface layer formed on basic igneous rock alluvium.

The available water holding capacity is 7 to 8 inches. Runoff is very slow to slow, and the hazard of erosion is none to slight.

This soil is used for irrigated apricots, prunes, vineyards, row crops, walnuts, and dryland hay or pasture. There is enough gravel present in the surface layer to interfere slightly with tillage. Capability unit IIe-1 (14) and IIIe-1 (15).

Gaviota Series

The Gaviota series consists of well-drained and somewhat excessively drained loams that are underlain by hard sandstone and shale bedrock at a depth of 6 to 20 inches. These soils are on the uplands and have slopes of 5 to 75 percent. The vegetation is annual grasses and forbs, oak trees, and brush. Elevation ranges from 500 to 4,000 feet. Average annual rainfall is 15 to 30 inches, and average annual temperature is about 58° to 60° F. The growing season is about 200 to 250 days. Gaviota soils are associated with the Los Gatos and Vallecitos soils.

In a representative profile, the surface layer is pale-brown and light yellowish-brown, slightly acid loam and gravelly loam that is about 19 inches thick and is underlain by hard sandstone. There are rock outcrops in some areas, and other areas are moderately eroded or severely eroded.

Gaviota soils are used for dryland hay, pasture, and range. They are also used for wildlife, recreation, and watershed.

Gaviota loam, 30 to 75 percent slopes (GcG).—This steep soil is on the uplands and has slopes that average about 60 percent.

Representative profile (on south-facing hillside above Mt. Hamilton Road about 3 miles above Kincaid Road intersection at road stake number B–8.70; NW¼NW¼ sec. 9, T. 9 S. R. 3 E.):

A11—0 to 5 inches, pale-brown (10YR 6/3) loam, dark brown (10YR 3/3) moist; moderate, medium and fine, granular structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine roots; many very fine interstitial pores, common very fine tubular pores, and few medium tubular pores; slightly acid (pH 6.5); clear wavy boundary. (4 to 6 inches thick.)

A12—5 to 19 inches, light yellowish-brown (10YR 6/4) gravelly loam, dark yellowish brown (10YR 3/4) moist; massive; slightly hard, friable, nonsticky and nonplastic; few very fine roots; many very fine tubular pores and few medium tubular pores; slightly acid (pH 6.5); clear, wavy boundary. (6 to 14 inches thick.)

R—19 inches, yellowish-brown, hard, fractured sandstone bedrock.

The A horizon is pale brown, light brownish gray, grayish brown, brown, or light yellowish brown. Reaction is slightly acid to neutral and changes very little with increasing depth. Rock fragments in the A12 horizon consist mostly of coarse gravel, but some fine to medium gravel and a few stones are present in places. Depth to bedrock ranges from 10 to 20 inches. There is little evidence of sheet erosion, but there are occasional shallow gullies.

Included with this soil in mapping are some areas of Vallecitos rocky loam and a few areas of Rock land.

This somewhat excessively drained soil has low fertility. The available water holding capacity is 2 to 3 inches. Permeability is moderate. Runoff is rapid to very rapid, and the hazard of erosion is high to very high. Effective rooting depth is shallow.

This soil is used for range, wildlife, watershed, and recreation. Capability unit VIIe-8(15); range site, Shallow Loamy.

Gaviota loam, 5 to 15 percent slopes, eroded (GcD2).—This soil has a profile that is similar to that of Gaviota loam, 30 to 75 percent slopes, but it is less sloping. Erosion has removed up to 4 inches of the surface layer. The depth to standstone is 6 to 16 inches.

Included with this soil in mapping are small areas of Hillgate silt loam and Pleasanton loam along drainageways, areas of Vallecitos rocky loam along ridge crests, and places where the soils have slopes of up to 20 percent.

This soil is well drained. Available water holding capacity is 1 to 2.5 inches. Runoff is slow to medium, and the hazard of erosion is slight to moderate.

This soil is used for pasture and range. Capability unit VIe-8(15); range site, Shallow Loamy.

Gaviota loam, 15 to 30 percent slopes (GcE).—This soil has a profile that is similar to that of Gaviota loam, 30 to 75 percent slopes.

Included with this soil in mapping are areas of Vallecitos rocky loam and Rock land.

Runoff is medium to rapid, and the hazard of erosion is moderate to high.

This soil is used for range. Capability unit VIe-8(15); range site, Shallow Loamy.

Gaviota gravelly loam, 30 to 75 percent slopes, eroded (GhG2).—This soil is on uplands and has an average slope of 45 percent. The surface layer is gravelly loam; it is about 20 percent (by volume) medium and fine gravel. Because of sheet erosion, depth to sandstone is 7 to 16 inches.

Included in mapping with this soil are areas of Vallecitos rocky loam that are severely eroded and Rock land.

This soil is somewhat excessively drained. The available water holding capacity is 1 to 2 inches. Natural fertility is very low.

This soil is used for limited range, recreation, and watershed. The brush cover limits the amount of available forage. Many areas have been burned, and they now support scattered brush and a scanty grass cover. Capability unit VIIe-8(15); range site, Shallow Gravelly Loam.

Gaviota gravelly loam, 30 to 75 percent slopes, severely eroded (GhG3).—This soil is on uplands. It has a profile that is similar to that of Gaviota loam, 30 to 75 percent slopes, but erosion has removed 75 percent of the surface layer and exposed the gravelly loam subsoil. Depth to bedrock is 6 to 10 inches.

Included with this soil in mapping are some areas of Rock land and of Vallecitos rocky loam, and areas where slopes exceed 75 percent.

This soil is somewhat excessively drained. The available water holding capacity is about 1 inch. Natural fertility is very low.

This brush-covered soil is used for range, wildlife, recreation, and watershed. Capability unit VIIe-8(15); range site, Shallow Gravelly Loam.

Gaviota rocky loam, 5 to 30 percent slopes, eroded (GkE2).—This soil is on uplands and has slopes that average about 25 percent. Texture is loam or shaly loam. Rock outcrops cover 2 to 10 percent of the surface. Because of sheet erosion, depth to sandstone is 10 to 17 inches.

Included with this soil in mapping are some areas of Vallecitos loam, and small areas that are severely eroded. In the San Antonio and Isabel Valleys, sloping areas of this soil are intermingled with fingerlike fans on which the Esparto soils are included.

This soil is well drained. Runoff is slow to medium, and the hazard of erosion is slight to moderate.

This soil is used for range. Capability unit VIe-7(15); range site, Shallow Loamy.

Gaviota-Los Gatos complex, 30 to 50 percent slopes (GmF).—This complex consists of about 50 percent Gaviota loam, 35 percent Los Gatos gravelly loam, and 15 percent included soils. These soils are on uplands having an annual grass-woodland cover. Gaviota soils occupy the ridges and south slopes and Los Gatos soils occupy areas on the north slopes.

The Gaviota soils have a profile similar to that of Gaviota loam, 30 to 75 percent slopes. The available water holding capacity is 2 to 3 inches. Permeability is moderate. Effective rooting depth is 10 to 19 inches. Natural fertility is low.

The Los Gatos soils have a profile similar to that of Los Gatos gravelly loam, 50 to 75 percent slopes. The available water holding capacity is 4 to 7 inches. Permeability is moderately slow. Effective rooting depth is 25 to 50 inches. Natural fertility is moderate.

Included with these soils in mapping are some areas of Los Osos clay loam and Vallecitos rocky loam.

Runoff on these soils is rapid, and the hazard of erosion is high.

These soils are used for range. This complex is in capability unit VIIe-8 (15). Gaviota soil: range site, Shallow Loamy. Los Gatos soil: range site, Loamy.

Gilroy Series

The Gilroy series consists of well-drained clay loams that are underlain by basic igneous bedrock at a depth of 18 to 36 inches. These soils are on uplands and have slopes of 5 to 75 percent. The vegetation, where these soils are not cultivated, is annual grasses and forbs, oak trees, and brush. Elevation ranges from 500 to 2,000 feet. Average annual rainfall is about 20 to 25 inches, and average annual temperature is about 58° to 60° F. The growing season is about 200 to 250 days. Gilroy soils are associated with the Los Gatos, Maymen, and Henneke soils.

In a representative profile, the surface layer is a brown, medium acid clay loam about 8 inches thick. The subsoil is reddish-brown, medium acid clay loam that is underlain at 21 inches by brown, weathered basic igneous rock. In a few places these soils are eroded.

Gilroy soils are used for dryland vineyards, hayland, pasture, and range.

Gilroy clay loam, 30 to 50 percent slopes (GoF).—This soil is on well-rounded ridges and steep side slopes in the uplands.

Representative profile (0.4 mile east of Castro Valley Ranch gate on hillside northeast of Castro Valley Road; NE¼SW¼ sec. 18, T. 11 S., R. 4 E.):

A1—0 to 8 inches, brown (7.5YR 5/4) clay loam containing about 5 percent gravel (by volume), dark-brown (7.5 YR 3/2) moist; moderate, medium and fine, granular structure; hard, very friable, sticky and plastic; common, very fine roots; many very fine interstitial pores and common very fine tubular pores; medium acid (pH 6.0); clear, wavy boundary. (8 to 10 inches thick.)

B2t—8 to 21 inches, reddish-brown (5YR 4/3) clay loam containing about 5 percent (by volume) gravel, dark reddish brown (5YR 3/2) moist; moderate, medium, subangular blocky structure; hard, very friable, sticky and plastic; few very fine roots; many very fine interstitial pores and few fine and medium tubular pores; common thin clay films on ped surfaces and in pores; medium acid (pH 6.0); abrupt, irregular boundary. (12 to 26 inches thick.)

R—21 inches, brown, metamorphosed basic igneous rock (greenstone) with moderately thick clay films and black manganese stains on rock surfaces.

The A horizon typically is brown, but in some places it is dark brown, dark reddish brown, or reddish brown. Texture is clay loam that commonly contains 5 to 8 percent (by volume) medium and fine gravel. The B horizon is generally reddish brown, but in some places it is brown or dark brown. Texture is clay loam or gravelly clay loam. In a few places the B horizon tongues into fracture planes of the bedrock. Soft to hard greenstone is at a depth of 20 to 36 inches.

Included with this soil in mapping are a few areas of Los Gatos gravelly loam and small areas of clay.

The available water holding capacity of this soil is 4 to 7.5 inches. Runoff is rapid, and the hazard of erosion is high. Permeability in the subsoil is moderately slow. This soil is moderately fertile. Effective rooting depth is moderately deep.

This soil is used for range. Capability unit VIe-1 (15); range site, Loamy.

Gilroy clay loam, 5 to 30 percent slopes (GoD).—This soil is on uplands that have well-rounded ridges and footslopes. The average slope is about 20 percent.

Included with this soil in mapping are Los Gatos gravelly loam and areas of rock outcrops.

Runoff on this soil is slow to rapid, and the hazard of erosion is slight to high.

This soil is used for dryland pasture and range. Capability unit IVe-1 (15); range site, Loamy.

Gilroy clay loam, 15 to 30 percent slopes, eroded (GoE2).—This soil has a profile that is similar to that of Gilroy clay loam, 30 to 50 percent slopes, but is less sloping. Sheet erosion has removed an average of 2 to 3 inches of the surface layer. Depth to basic igneous bedrock is 18 to 33 inches.

Included with this soil in mapping are areas that have been subject to severe rill and sheet erosion and small areas of shallow soils. Tillage has mixed the soft, weathered bedrock with the surface layer and subsoil in a few areas.

Runoff is medium to rapid, and the hazard of erosion is moderate to high.

Most of the acreage of this soil in the past was planted to grapes or was used for dryland grain hay, but now most of it is used for pasture or range. Capability unit IVe–1 (15); range site, Loamy.

Gilroy clay loam, 50 to 75 percent slopes (GoG).—This soil has a profile that is similar to that of Gilroy clay loam, 30 to 50 percent slopes, but it is steeper. The surface layer is dark brown or dark reddish brown on the north slopes.

Included with this soil in mapping are a few areas of Los Gatos gravelly loam and Maymen rocky fine sandy loam, areas of rock outcrops, and some places where depth to bedrock is 40 to 50 inches.

Runoff on this soil is very rapid, and the hazard of erosion is very high.

This soil is used for range, wildlife, recreation, and watershed. Capability unit VIIe–1 (15); range site, Loamy.

Henneke Series

The Henneke series consists of somewhat excessively drained gravelly clay loams that are underlain by serpentine bedrock at a depth of 11 to 18 inches. These soils are on uplands and have slopes of 30 to 75 percent. The vegetation is brush and some Digger pines. Elevation ranges from 1,600 to 2,500 feet. Average annual rainfall is 16 to 20 inches, and average annual temperature is about 58° to 60° F. The growing season is about 200 to 250 days. Henneke soils are associated with the Gaviota, Los Gatos, and Vallecitos soils.

In a representative profile, the surface layer is reddish-brown, neutral gravelly clay loam about 1 inch thick. The subsoil is dark reddish brown, neutral very gravelly clay that is underlain at a depth of 15 inches by serpentine bedrock. Rock outcrops are on 2 to 10 percent of the surface.

Henneke soils are used mainly for watershed, recreation, and wildlife.

Henneke rocky clay loam, 30 to 75 percent slopes, severely eroded (HeG3).—This soil lies on uplands and has slopes that average 60 percent.

Representative profile (from intersection of Mines and Blackbird Valley roads, up hillside about 200 yards from "S" turn on Mines road, in northwest corner of SE¼ sec. 11, T. 6 S., R. 4 E.):

A1—0 to 1 inch, reddish-brown (5YR 4/3) gravelly clay loam, dark reddish brown (5YR 2/2) moist; strong, fine, granular structure; slightly hard, very friable, sticky and plastic; few very fine, fine, medium, and coarse roots; many very fine interstitial pores; neutral (pH 7.0); clear, smooth boundary. (1 to 4 inches thick.)

B2t—1 to 15 inches, dark reddish-brown (5YR 3/3) very gravelly clay containing 55 percent (by volume) medium and fine gravel, dark reddish brown (5YR 2/2) moist; strong, fine and medium, subangular blocky structure; hard, friable, sticky and plastic; few, very fine, medium, and coarse roots; many very fine interstitial and tubular pores and few medium and coarse tubular pores; many moderately thick clay films on ped surfaces and in pores; neutral (pH 7.0); clear, smooth boundary.

R—15 inches, serpentine rock.

The A horizon is strong brown or reddish brown. Reaction is slightly acid to neutral. Texture is clay loam, gravelly clay loam, or loam. The B horizon is slightly acid to neutral. Depth to bedrock ranges from 11 to 18 inches. This soil is severely eroded. Rock outcrops cover about 2 to 10 percent of the surface.

Included with this soil in mapping are small areas of Gaviota loam, Vallecitos rocky loam, and Rock land. Also included are areas that have less than 30 percent gravel throughout the profile.

The available water holding capacity of this soil is 1 to 2 inches. Permeability is slow. Runoff is rapid to very rapid, and the hazard of erosion is high to very high. Natural fertility is low. Effective rooting depth is shallow.

This soil is used for range, wildlife, recreation, and watershed. Capability unit VIIe–9 (15); range site, Serpentine.

Hillgate Series

The Hillgate series consists of well-drained silt loams that have developed in alluvial materials from mixed sources. These soils are on terraces and have slopes of 2 to 50 percent. The vegetation, where these soils are not cultivated, is annual grasses, forbs, and scattered oak trees. Elevation ranges from 200 to 2,000 feet. Average annual rainfall is 16 to 25 inches, and average annual temperature is about 58° to 60° F. The growing season is about 260 to 275 days. Hillgate soils are associated with the Azule, Pleasanton, and San Ysidro soils.

In a representative profile, the surface layer is pale-brown and brown, medium acid silt loam about 10 inches thick. The subsoil is strong-brown and brownish-yellow, medium acid clay and clay loam that are underlain at a depth of 40 inches by brownish-yellow, medium acid gravelly clay loam.

Hillgate soils are used for irrigated apricots, vineyards, prunes, and dryland hay, pasture, and range.

Hillgate silt loam, 9 to 15 percent slopes, eroded (HfD2).—This soil is on terraces.

Representative profile (from intersection of Church and New Avenues, 200 yards east and 200 yards south in field; SW¼NW¼ sec. 8, T. 10 S., R. 4 E.):

Ap—0 to 5 inches, pale-brown (10YR 6/3) silt loam, dark brown (10YR 4/3) moist; massive; hard, friable, nonsticky and nonplastic; many fine and very fine roots; many very fine interstitial pores and few very fine and fine tubular pores; medium acid (pH 5.8); abrupt, smooth boundary. (4 to 7 inches thick.)

A1—5 to 10 inches, brown (10YR 5/3) silt loam, dark brown (10YR 4/3) moist; massive; very hard, friable, nonsticky and nonplastic; few very fine roots; many very fine interstitial pores, many very fine tubular pores, and few medium tubular pores; medium acid (pH 5.8); abrupt, smooth boundary. (4 to 19 inches thick.)

B2t—10 to 26 inches, strong-brown (7.5YR 5/6) clay, dark brown (7.5YR 4/4) moist; moderate, coarse, prismatic structure parting to strong, coarse and medium, angular blocky structure; extremely hard, very firm, sticky and very plastic; few very fine roots; many very fine interstitial pores, common very fine tubular pores, and few fine tubular pores; many, moderately thick, reddish-brown (5YR 5/4) moist clay films on ped surfaces and in pores; medium acid (pH 5.8); gradual, wavy boundary. (14 to 24 inches thick.)

B3t—26 to 40 inches, brownish-yellow (10YR 6/6) clay loam, yellowish brown (10YR 5/4) moist; moderate, coarse, angular blocky structure; very hard, firm, sticky and very plastic; many very fine interstitial pores, common very fine tubular pores, and a few fine tubular pores; common, thin, reddish-yellow (7.5YR 6/6), strong-brown (7.5YR 5/6), moist clay films on ped surfaces and in pores; medium acid (pH 5.8); clear, smooth boundary. (12 to 20 inches thick.)

IIC—40 to 60 inches, brownish-yellow (10YR 6/6) gravelly clay loam, yellowish brown (10YR 5/4) moist; weak, medium, subangular blocky structure; hard, friable, sticky and plastic; many very fine interstitial pores and a few very fine and fine tubular pores; few, thin, reddish-yellow (7.5YR 6/6), strong-brown (7.5YR 5/6) moist clay films on ped surfaces and in pores; medium acid (pH 5.8).

The A horizon ranges from pale brown to brown, or grayish brown. Reaction is neutral to medium acid. Texture is silt loam or fine sandy loam. The B horizon is brown, strong brown, or brownish yellow. Texture is clay or gravelly clay and ranges to clay loam in the lower part of the B horizon. Depth to the clay B2t horizon averages 10 inches but it ranges from 8 to 20 inches.

Included with this soil in mapping are 40 acres of soils along Little Arthur Creek that are underlain by sandstone bedrock at a depth of 20 to 40 inches. Also included are small areas of Pleasanton gravelly loam and San Ysidro loam. Other included areas have a yellowish-red and reddish-brown B horizon or a calcareous substratum.

The available water holding capacity of this soil is 4 to 7 inches. Permeability is very slow. Runoff is medium, and the hazard of erosion is moderate. Natural fertility is low. Effective rooting depth is very deep.

This soil is used for dryland hay, pasture, and range. Capability unit VIe-3 (15); range site, Claypan.

Hillgate silt loam, 2 to 9 percent slopes (HfC).—This soil is on terraces. It has a profile that is similar to that of Hillgate silt loam, 9 to 15 percent slopes, eroded, but the surface layer is 20 to 26 inches thick. Erosion is none to slight.

Included with this soil in mapping are small areas of Pleasanton gravelly loam and San Ysidro loam.

Natural fertility of this soil is moderate. Effective rooting depth is very deep.

This soil is used for irrigated prunes, apricots, and grapes, and for dryland hay and pasture. Capability unit IIIe-3 (14).

Hillgate silt loam, 15 to 30 percent slopes, eroded (HfE2).—This soil has a profile that is similar to that of Hillgate silt loam, 9 to 15 percent slopes, eroded, but has a surface layer 10 to 20 inches thick.

Included with this soil in mapping are small areas of Azule clay loam and areas that have been subject to severe sheet and gully erosion. Also included in the San Antonio Valley are areas of a soil that is moderately alkaline and is calcareous in the substratum.

Runoff is medium to rapid, and the hazard of erosion is moderate to high.

This soil is used for range. Capability unit VIe-3 (15); range site, Claypan.

Hillgate silt loam, 30 to 50 percent slopes, eroded (HfF2).—This soil has a profile that is similar to that of Hillgate silt loam, 9 to 15 percent slopes, eroded, but it is more sloping and depth to the clay subsoil is 10 to 20 inches. Texture of the subsoil ranges from heavy clay loam to clay, and in some places it is gravelly.

Included with this soil in mapping are areas of Azule clay loam and small areas that have been subject to severe sheet and gully erosion.

The available water holding capacity is 2 to 4 inches for the 10- to 20-inch rooting depth. Runoff is rapid, and the hazard of erosion is high.

This soil is used for range. Capability unit VIIe-1 (15); range site, Claypan.

Inks Series

The Inks series consists of somewhat excessively drained gravelly clay loams that are underlain by metamorphosed basic igneous bedrock at a depth of 11 to 19 inches. They are on uplands and have slopes of 30 to 75 percent. The vegetation mainly is brush, but there are a few open areas of annual grasses and forbs. Elevation ranges from 200 to 2,000 feet. Average annual rainfall is 20 to 25 inches, and average annual temperature is about 58° to 60° F. The growing season is about 200 to 250 days. Inks soils are associated with the Los Gatos and Montara soils.

In a representative profile, the surface layer is brown, slightly acid gravelly clay loam about 1 inch thick. In some places it is stony clay loam. The subsoil is dark reddish-brown, slightly acid gravelly clay loam that is underlain at a depth of 15 inches by hard, shattered metamorphosed basalt.

Inks soils are used for range, wildlife, recreation, and watershed.

Inks rocky clay loam, 50 to 75 percent slopes, eroded (InG2).—This soil is on uplands.

Representative profile (near Morgan Hill, about 1 mile north of Pigeon Point on road along ridge):

A1—0 to 1 inch, brown (7.5YR 5/4) gravelly clay loam, 20 percent (by volume) gravel, ¼ to 1 inch in diameter, dark brown (7.5YR 3/2) moist; weak, medium, subangular blocky structure parting to moderate, fine, granular structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine roots; many very fine interstitial and tubular pores; slightly acid (pH 6.5); abrupt, smooth boundary. (1 to 4 inches thick.)

B2t—1 to 15 inches, dark reddish-brown (5YR 3/3) gravelly clay loam, dark reddish brown (5YR 3/2) moist; moderate, medium, subangular blocky structure; hard, friable, sticky and plastic; few very fine roots; many very fine interstitial and tubular pores; continuous thin clay films on ped surfaces and in pores; slightly acid (pH 6.5); clear, irregular boundary. (11 to 15 inches thick.)

R—15 inches, hard metamorphosed basalt.

The A horizon is brown or dark brown. Reaction is slightly acid to neutral and changes little with depth. Texture is gravelly loam or gravelly clay loam. Percentage of gravel by volume generally is between 20 and 40 percent. The B horizon is typically dark reddish brown but in places is brown or dark brown. Texture is gravelly clay loam that contains 30 to 40 percent rock fragments 1 to 6 inches in diameter. Depth to hard bedrock ranges from 11 to 19 inches. About 2 to 10 percent of the surface is covered by rock outcrops, and variable amounts of stones are on the surface.

Included with this soil in mapping are some areas of Montara rocky clay loam and Henneke rocky clay loam, small areas of Rock land, and areas of soils that have steep and moderately steep slopes.

The available water holding capacity of this soil is 1 to 2 inches. Permeability in the subsoil is moderately slow. Runoff is very rapid, and the hazard of erosion is very high.

Fertility is low. Effective rooting depth is shallow to bedrock.

This soil is used for range, wildlife, and watershed. Capability unit VIIe-7 (15); range site, Shallow Loamy.

Inks stony clay loam, 30 to 75 percent slopes, severely eroded (IsG3).—This soil is on uplands and has slopes that average about 60 percent. Stones and rock outcrops cover about 3 to 10 percent of the surface. The surface layer has been removed in most places by erosion. Depth to bedrock is 11 to 15 inches.

Included with this soil in mapping are small areas of Henneke rocky clay loam and areas of soils that have slopes of 15 to 30 percent.

This soil is used for range, wildlife, recreation, and watershed. Capability unit VIIe-7 (15); range site, Shallow Gravelly Loam.

Keefers Series

The Keefers series consists of well-drained clay loams that are underlain by alluvium from basic igneous rock. These soils lie on old fans and have slopes of 0 to 9 percent. The vegetation, where these soils are not cultivated, is annual grasses, forbs, and scattered oak trees. Elevation ranges from 200 to 800 feet. Average annual rainfall is 16 to 20 inches, and average annual temperature is 58° to 60° F. The growing season is 260 to 275 days. Keefers soils are associated with the Cropley and Los Robles soils.

In a representative profile, the surface layer is brown, slightly acid clay loam about 12 inches thick. The subsoil is reddish-brown and brown, slightly acid to mildly alkaline gravelly clay loam, very gravelly clay loam, and gravelly clay to a depth of 60 inches or more.

Keefers soils are used for irrigated row crops, orchards, vineyards, pasture, and dryland hay.

Keefers clay loam, 2 to 9 percent slopes, eroded (KeC2).—This soil is on smooth, old fans and has slopes that average 5 percent.

Representative profile (off California Avenue, about 20 feet north and 100 yards east of its intersection with Cooledge Avenue):

Ap—0 to 5 inches, brown (7.5YR 5/4) clay loam containing 10 percent (by volume) medium and fine gravel, dark reddish brown (5YR 3/3) moist; moderate, medium and fine, granular structure; slightly hard, very friable, slightly sticky and slightly plastic; few fine and medium roots; many fine interstitial and tubular pores; slightly acid (pH 6.5); clear, smooth boundary. (5 to 7 inches thick.)

A1—5 to 12 inches, brown (7.5YR 5/4) clay loam containing 10 percent (by volume) medium and fine gravel, dark reddish brown (5YR 3/4) moist; massive; hard, very friable, slightly sticky and slightly plastic; few fine roots; many very fine interstitial pores and few medium tubular pores; slightly acid (pH 6.5); clear, wavy boundary. (7 to 9 inches thick.)

B1t—12 to 23 inches, reddish-brown (5YR 5/3) gravelly clay loam containing 20 percent (by volume) medium and fine gravel, dark reddish brown (5YR 3/4) moist; moderate, medium, subangular blocky structure; hard, very friable, sticky and plastic; few fine and medium roots; many very fine interstitial and tubular pores; few thin clay films on ped surfaces and in pores; slightly acid (pH 6.5); clear, wavy boundary. (10 to 12 inches thick.)

B2t—23 to 38 inches, reddish-brown (5YR 4/3) very gravelly heavy clay loam containing about 60 percent (by volume) medium and fine gravel, dark reddish brown (5YR 3/4) moist; moderate, medium, subangular blocky structure; hard, friable, sticky and plastic; many very fine interstitial and tubular pores; many moderately thick clay films on ped surfaces and in pores; neutral (pH 7.0); clear, irregular boundary. (14 to 18 inches thick.)

IIB3t—38 to 60 inches, brown (7.5YR 5/4) gravelly clay containing about 20 percent (by volume) fine gravel, dark brown (7.5YR 4/4) moist; massive; very hard, firm, sticky and plastic; many very fine interstitial pores; common thin clay films lining pores and coating the fine gravel; some manganese coatings on gravel; mildly alkaline (pH 7.5).

The A horizon is typically brown but in places is dark brown or reddish brown. Texture is clay loam, and this horizon contains up to 15 percent (by volume) medium and fine gravel. The B2t horizon is very gravelly heavy clay loam or very gravelly clay. The gravel is generally fine but ranges to medium or coarse and averages a little more than 50 percent by volume. In most areas this soil overlies unrelated gravelly clay or clay in the IIB3t or IIC horizons at a depth of 36 to 60 inches.

Included with this soil in mapping are small seep and marsh areas and a few areas of Cropley clay.

The available water holding capacity of this soil is 6.5 to 8 inches. Permeability in the subsoil is slow. Runoff is slow to medium, and the hazard of erosion is slight to moderate. Natural fertility is moderate. Effective rooting depth is very deep.

This soil is used for irrigated row crops, prunes, grapes, and walnuts. A few areas are used for dryland pasture or grain hay. Capability unit IIIe-3(14).

Keefers clay loam, 0 to 2 percent slopes (KeA).—This soil lies on smooth, old fans. Hazard of erosion is slight.

Included with this soil in mapping are small areas of Cropley clay and San Ysidro loam, small seep and marsh areas, and areas of gravelly clay loam and gravelly loam.

Runoff is very slow, and water tends to pond during the rainy season. The hazard of erosion is none to slight.

This soil is used for irrigated row crops, prunes, walnuts, and pasture. A few areas are used for dryland pasture or grain hay. Capability unit IIIs-3(14).

Landslides

Landslides (LaF) consists of areas of soils that have moved downslope and have an uneven or broken surface as a result of slippage. Soil material is generally fine textured and ranges from clay loam to clay. The soil mantle and water regime have been disturbed so much that the soil characteristics are unpredictable. Landslides occur on slopes of 30 to 50 percent and are associated mainly with Altamont, Azule, Climara, and Diablo soils.

This well-drained land type is moderately fertile. Available water holding capacity is 5 to 8 inches. Runoff is rapid, and the hazard of erosion is high.

This land type is used for range. Capability unit VIIe-5(15); range site, Clayey.

Los Gatos Series

The Los Gatos series consists of well-drained gravelly loams that are underlain by metamorphosed shale at a depth of 25 to 50 inches. These soils have slopes of 15 to 75 percent and are on uplands. Vegetation consists mainly of oaks that have an understory of brush, grass, and forbs. Elevation ranges from 500 to 4,000 feet. Average annual rainfall is about 25 to 40 inches, and average temperature is about 55° to 56° F. The growing season is 200 to 250

Los Osos Series

The Los Osos series consists of well-drained clay loams that are underlain by sedimentary rock at a depth of 26 to 40 inches. These soils have slopes of 15 to 75 percent and are on uplands. The vegetation, where these soils are not cultivated, is annual grasses and forbs, oak trees, and brush. Elevation ranges from 300 to 1,200 feet. Average annual rainfall is 16 to 25 inches, and average annual temperature is about 58° to 60° F. The growing season is about 200 to 250 days. Los Osos soils are associated with the Azule and Los Gatos soils.

In a representative profile, the surface layer is a dark grayish-brown, slightly acid clay loam about 10 inches thick. The subsoil is dark-brown, slightly acid clay that is underlain at a depth of 36 inches by moderately hard, fine-grained sandstone and shale.

Los Osos soils are used for dryland hay, pasture, and range.

Los Osos clay loam, 15 to 30 percent slopes (LoE).—This soil is on uplands and has slopes that average about 20 percent.

Representative profile (0.7 mile east on Highway 152 from San Felipe Road, 0.5 mile up old Pacheco Pass Road, 0.5 mile north on ridge by old corral):

A1—0 to 10 inches, dark grayish-brown (10YR 4/2) clay loam, very dark grayish brown (10YR 3/2) moist; moderate, medium, subangular blocky structure; hard, friable, sticky and plastic; many very fine roots; many very fine interstitial pores, common very fine tubular pores, and few fine tubular pores; slightly acid (pH 6.1); gradual, smooth boundary. (8 to 12 inches thick.)

B21t—10 to 23 inches, dark-brown (10YR 4/3) clay, very dark grayish brown (10YR 3/2) moist; strong, medium and coarse, subangular blocky structure; hard, friable, sticky and plastic; few very fine roots; many very fine interstitial and tubular pores; many thin clay films on ped surfaces and in pores; slightly acid (pH 6.5); clear, wavy boundary. (9 to 14 inches thick.)

B22t—23 to 36 inches, dark-brown (10YR 4/3) clay, dark brown (10YR 3/3) moist; weak, coarse, subangular blocky structure; very hard, firm, sticky and plastic; few very fine roots; common fine tubular pores; continuous thin clay films on ped surfaces and in pores; slightly acid (pH 6.5); clear, wavy boundary. (9 to 14 inches thick.)

R—36 inches, yellowish-brown, moderately hard, fine-grained sandstone and shale.

The A horizon is grayish brown or dark grayish brown. Reaction is neutral to medium acid. Texture is typically clay loam but ranges to loam. The B horizon is brown, dark brown, or yellowish brown. Texture is heavy clay loam or clay. Reaction is slightly acid to neutral. Depth to parent bedrock ranges from 26 to 40 inches. Lime is present in seams of the bedrock in a few places.

Included with this soil in mapping are some areas of Gaviota loam and Los Gatos gravelly loam, areas of rock outcrop, and areas that are moderately eroded to severely eroded.

Available water holding capacity is 4 to 8 inches, depending on depth to bedrock. Permeability in the subsoil is slow. Runoff is medium to rapid, and the hazard of erosion is moderate to high. This soil is highly fertile. Effective rooting depth is moderately deep.

This soil is used for dryland hay, pasture, and range. Capability unit IVe-3 (15); range site, Fine Loamy.

Los Osos clay loam, 30 to 50 percent slopes (LoF).—This soil lies on uplands. The slopes are generally complex and average about 40 percent.

Included with this soil in mapping are areas of Diablo clay and areas that have been subject to moderate to severe sheet erosion.

Runoff is rapid, and the hazard of erosion is high.

This soil is used for range. Capability unit VIe-3 (15); range site, Fine Loamy.

Los Osos clay loam, 50 to 75 percent slopes (LoG).—This soil is on uplands. The slopes are generally complex and average about 55 percent. Vegetation on the northerly slopes consists of oak trees that have an understory of brush, grasses, and forbs. On the southerly slopes are mostly open stands of grasses and forbs.

Included with this soil in mapping are small areas of Altamont clay and San Benito clay loam, areas of Rock land, and areas that have been subject to moderate to severe sheet erosion.

Runoff is very rapid, and the hazard of erosion is very high.

This soil is used for range. Capability unit VIIe-1 (15); range site, Fine Loamy.

Los Robles Series

The Los Robles series consists of well-drained clay loams that are underlain by stratified basic igneous rock alluvium. These soils are on alluvial fans and have slopes of 0 to 9 percent. Vegetation, where these soils are not cultivated, is annual grasses, forbs and scattered large oak trees. Elevation ranges from 200 to 1,000 feet. Average annual rainfall is 16 to 20 inches, and average annual temperature is 58° to 60° F. The growing season is about 260 to 275 days. Los Robles soils are associated with the Cropley and Keefers soils.

In a representative profile, the surface layer is dark-brown neutral clay loam about 9 inches thick. The subsoil is dark-brown and brown, neutral clay loam and gravelly clay loam that is underlain at a depth of 58 inches by yellowish-brown, neutral gravelly fine sandy clay loam.

Los Robles soils are used for irrigated row crops, orchards, vineyards, dryland hay, and pasture.

Los Robles clay loam, 0 to 2 percent slopes (LrA).—This soil is on smooth fans.

Representative profile (about 1,000 feet north on Turlock Avenue from intersection with Fitzgerald Road, in prune orchard about 12 tree rows south from driveway and 6 tree rows east from loading area):

Ap1—0 to 5 inches, dark-brown (7.5YR 4/2) clay loam, dark brown (7.5YR 3/2) moist; massive; slightly hard, very friable, sticky and plastic; many very fine roots; many very fine interstitial pores; neutral (pH 7.0); abrupt, smooth boundary. (4 to 6 inches thick.)

Ap2—5 to 9 inches, dark-brown (7.5YR 4/2) clay loam, dark brown (7.5YR 3/2) moist; massive; slightly hard, very friable, sticky and plastic; common very fine roots; many very fine interstitial and tubular pores and few medium tubular pores; neutral (pH 7.0); clear, wavy boundary. (4 to 6 inches thick.)

B1t—9 to 14 inches, dark-brown (7.5YR 4/2) clay loam containing 8 percent (by volume) medium and the gravel, dark brown (7.5YR 3/2) moist; moderate, medium, subangular blocky structure; hard, friable, sticky and plastic; few very fine roots; many very fine interstitial and tubular pores and few fine and medium tubular pores; common thin clay films on ped surfaces and in pores; neutral (pH 7.0); clear, wavy boundary. (4 to 8 inches thick.)

B2t—14 to 28 inches, dark-brown (10YR 4/3) gravelly clay loam containing about 15 percent (by volume) fine gravel, dark brown (10YR 3/3) moist; moderate, medium, subangular blocky structure; hard, friable, sticky and plastic; few fine roots; many very fine interstitial and tubular pores and few medium tubular pores; continuous thin clay films on ped surfaces and in pores; neutral (pH 7.0); clear, wavy boundary. (12 to 16 inches thick.)

B3t—28 to 58 inches, brown (10YR 5/3) gravelly clay loam containing about 20 percent (by volume) fine gravel, dark brown (10YR 4/3) moist; weak, medium, subangular blocky structure; hard, friable, sticky and plastic; common thin clay films on ped surfaces and in pores; neutral (pH 7.0); clear, wavy boundary. (20 to 30 inches thick.)

C—58 to 60 inches, yellowish-brown (10YR 5/4) gravelly fine sandy clay loam containing about 40 percent (by volume) fine gravel, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, friable, sticky and plastic; many very fine interstitial and tubular pores; neutral (pH 7.0).

The A horizon is commonly dark brown or brown but ranges to dark grayish brown. It contains less than 1.2 percent organic matter below a depth of 5 inches. Reaction is slightly acid to neutral. The B horizon is dark-brown to brown clay loam containing 5 to 45 percent gravel, and content of gravel increases with depth. There is a slight increase in the content of clay in the B horizon. Reaction is slightly acid to mildly alkaline.

Included with this soil in mapping are some areas of Cropley clay and Keefers clay loam, small areas of gravelly loam, and some seep areas.

The available water holding capacity is about 9 to 11 inches. Runoff is very slow, and the hazard of erosion is none to slight. Permeability in the subsoil is moderately slow. Fertility is high. Effective rooting depth is very deep.

This soil is used for irrigated row crops, apricots, dryland hay, and pasture. Capability unit I–3 (14).

Los Robles clay loam, 2 to 9 percent slopes (LrC).—This soil is on small alluvial fans that extend up into narrow drainageways. The average slope is about 5 percent.

Included with this soil in mapping are small areas of Cropley clay, stringers of gravelly clay loam, and soils that developed from serpentine rock alluvium.

Runoff is slow to medium, and the hazard of erosion is slight to moderate.

This soil is used for irrigated prunes, row crops, grapes, apricots, walnuts, dryland hay, and pasture. Capability unit IIe–1 (14).

Madonna Series

The Madonna series consists of well-drained loams that are underlain by sedimentary bedrock at a depth of 20 to 28 inches. These soils have slopes of 15 to 75 percent and lie on uplands. The vegetation, where these soils are not cultivated, is oak trees, some brush, grasses, and forbs. Elevation ranges from 1,500 to 3,500 feet. Average annual rainfall is 35 to 50 inches, and average annual temperature is about 55° to 56° F. The growing season is about 200 to 250 days. Madonna soils are associated with the Maymen, Ben Lomond, and Los Gatos soils.

In a representative profile, the surface layer is pale-brown, medium acid loam about 7 inches thick. The subsoil is brown, medium acid loam. At a depth of 25 inches is light yellowish-brown, strongly acid sandstone.

Madonna soils are used for dryland hay, pasture, range, recreation, and watershed.

Madonna loam, 30 to 50 percent slopes (MbF).—This soil is on uplands and has slopes that average about 35 percent.

Representative profile (on west-facing slope 50 feet from intersection of old Watsonville Road, just below fence in the southeast corner; NW¼NW¼ sec. 21, T. 10 S., R. 2 E.):

A1—0 to 7 inches, pale-brown (10YR 6/3) loam, dark brown (10YR 4/3) moist; moderate, medium and fine, granular structure; hard, friable, nonsticky and nonplastic; many very fine roots; many very fine interstitial and tubular pores; medium acid (pH 5.6); clear, wavy boundary. (8 to 10 inches thick.)

B2—7 to 25 inches, brown (10YR 5/3) loam, dark brown (10YR 4/3) moist; weak, medium, subangular blocky structure; hard, friable, nonsticky and nonplastic; few very fine roots; many very fine interstitial and tubular pores and few medium tubular pores; medium acid (pH 5.6); clear, wavy boundary. (12 to 18 inches thick.)

R—25 inches, light yellowish-brown (10YR 6/4), strongly acid sandstone.

The A horizon generally is pale brown, light brownish gray, or brown. In a few areas, however, it is grayish brown in the upper 4 inches. Texture is loam, light loam, or fine sandy loam. The B horizon is pale brown, brown, light yellowish brown, or very pale brown. Texture is loam, light loam, or fine sandy loam. Reaction is medium acid to strongly acid. Depth to the strongly acid hard sandstone bedrock ranges from 20 to 28 inches.

Included with this soil in mapping are small areas of Maymen rocky fine sandy loam along the ridge crests, small areas that have been subject to moderate to severe sheet erosion, and areas of rock outcrop.

The available water holding capacity of this soil is about 3 to 5 inches. Permeability is moderate. Runoff is rapid, and the hazard of erosion is high. Natural fertility is moderate. Effective rooting depth is moderately deep to bedrock.

This soil is used for range, recreation, and watershed. Capability unit VIe–8 (4); range site, Loamy.

Madonna loam, 15 to 30 percent slopes (MbE).—This soil is on uplands, mainly on top of the round, broad ridges or on footslopes.

Included with this soil in mapping are some areas that have been subject to moderate and severe sheet erosion, and areas of rock outcrop.

Runoff is medium to rapid. The hazard of erosion is moderate to high.

This soil is used for dryland grain hay, pasture, and range. Capability unit IVe–8 (4); range site, Loamy.

Madonna loam, 50 to 75 percent slopes (MbG).—This soil has very steep slopes that average about 55 percent.

Included with this soil in mapping are some areas of Los Gatos gravelly loam, Maymen rocky fine sandy loam, and Rock land.

Runoff is very rapid. The hazard of erosion is very high.

This soil has limited use for range. It is used for recreation and watershed. Capability unit VIIe–8 (4); range site, Loamy.

Maxwell Series

The Maxwell series consists of moderately well drained clays that are underlain by serpentine alluvium. These soils are on alluvial fans and have slopes of 0 to 5 percent. The vegetation, where these soils are not cultivated, is annual grasses and scattered oaks. Elevation ranges from 200 to 1,000 feet. Average annual rainfall is 16 to 20 inches, and average annual temperature is 58° to 60° F. The growing season is about 260 to 275 days. Maxwell soils are associated with the Climara and Montara soils.

In a representative profile, the surface layer is very dark gray, neutral and mildly alkaline clay about 25 inches thick. The next layer is dark-gray, moderately alkaline clay that is underlain at a depth of 46 inches by dark grayish-brown, calcareous, moderately alkaline gravelly clay loam that extends to a depth of 60 inches or more. When these soils are dry, deep cracks develop in the surface layer and in the upper part of the substratum.

Maxwell soils are used for irrigated orchards, dryland grain hay, and pasture.

Maxwell clay, 0 to 5 percent slopes (McB).—This soil is on alluvial fans.

Representative profile (in field by fence corner on south side of road, 1,400 feet west on Llagas Avenue from intersection with Orchard Avenue):

Ap—0 to 7 inches, very dark gray (10YR 3/1) clay, black (10YR 2/1) moist; strong, medium and fine, granular structure; very hard, very firm, sticky and very plastic; many very fine roots; many very fine interstitial pores; neutral (pH 7.0); abrupt, smooth boundary. (4 to 10 inches thick.)

A1—7 to 25 inches, very dark gray (10YR 3/1) clay, black (10YR 2/1) moist; moderate, coarse, prismatic structure; very hard, very firm, sticky and very plastic; few very fine roots; many very fine interstitial pores; common fine and medium slickensides; mildly alkaline (pH 7.5); clear, wavy boundary. (20 to 30 inches thick.)

C1—25 to 46 inches, dark-gray (10YR 4/1) clay, very dark gray (10YR 3/1) moist; massive; hard, firm, sticky and very plastic; many very fine interstitial and tubular pores; common fine and medium slickensides; moderately alkaline (pH 8.0); clear, smooth boundary. (12 to 24 inches thick.)

C2—46 to 60 inches, dark grayish-brown (2.5Y 4/2) gravelly clay loam, very dark grayish brown (2.5Y 3/2) moist; massive; hard, friable, sticky and plastic; many very fine interstitial and tubular pores; calcareous, moderately alkaline (pH 8.0).

The A horizon is dark gray or very dark gray. Reaction is neutral to mildly alkaline. Depth to lime ranges from 24 to 48 inches. When the soil is dry, deep cracks develop that average from ½ to 1½ inches in width in the A horizon and in the upper part of the C horizon.

Included with this soil in mapping are small areas of gravelly clay texture and a few areas of buried soils that have characteristics similar to those of the Hillgate and Pleasanton soils.

The available water holding capacity of this soil is 8 to 10 inches. Permeability is slow. Runoff is very slow to slow, and the hazard of erosion is none to slight. This soil has low natural fertility because of an unfavorable calcium-magnesium ratio. Effective rooting depth is very deep.

This soil is used for irrigated prunes, dryland grain hay, and pasture. Capability unit IVs–9 (14).

Maymen Series

The Maymen series consists of somewhat excessively drained fine sandy loams that are underlain by sedimentary rock at a depth of 11 to 19 inches. These soils lie on uplands and have slopes of 15 to 75 percent. Vegetation is mainly brush or hardwoods that have an understory of dense brush. Elevation ranges from 1,600 to 4,000 feet. Average annual rainfall is 30 to 50 inches, and average annual temperature is 55° to 56° F. The growing season is about 200 to 250 days. Maymen soils are associated with the Los Gatos and Madonna soils.

In a representative profile, the surface layer is brown, medium acid fine sandy loam about 3 inches thick. The subsoil is light-brown, strongly acid fine sandy loam that is underlain at a depth of 14 inches by very pale brown, strongly acid, hard, fractured sandstone. In some areas rock outcrops cover 5 to 10 percent of the surface.

Maymen soils are used for range, wildlife, recreation, and watershed.

Maymen rocky fine sandy loam, 50 to 75 percent slopes, eroded (MfG2).—This soil is on uplands and has slopes that average about 60 percent.

Representative profile (on ridge between Eastman and Murphy Canyons, 2 miles east of Mt. Madonna Road; SW¼SW¼ sec. 15, T. 10 S., R. 2 E.):

01—1 inch to 0, undecomposed leaves, pine needles, and twigs; abrupt, smooth boundary. (1 to 2 inches thick.)

A1—0 to 3 inches, brown (10YR 5/3) fine sandy loam, dark brown (10YR 3/3) moist; moderate, fine, granular structure; soft, very friable, nonsticky and nonplastic; few fine and very fine roots; many very fine interstitial pores; medium acid (pH 5.6); abrupt, smooth boundary. (1 to 4 inches thick.)

B2—3 to 14 inches, light-brown (7.5YR 6/4) fine sandy loam, brown (7.5YR 5/4) moist; weak, medium and fine, subangular blocky structure; soft, very friable, nonsticky and nonplastic; few, fine, medium, and coarse roots; many very fine interstitial pores and few medium and fine tubular pores; strongly acid (pH 5.1); clear, wavy boundary. (10 to 15 inches thick.)

R—14 inches, very pale brown, strongly acid, hard, fractured sandstone.

The A horizon is brown, pale brown, or yellowish brown. Reaction is medium acid to strongly acid. Texture is fine sandy loam, loam, or sandy loam. About 5 to 10 percent of the surface is rock outcrops. Depth to sandstone or shale ranges from 11 to 19 inches.

Included with this soil in mapping are some areas of Los Gatos gravelly loam, small areas of Rock land, and a few areas that have slopes ranging to 80 percent.

This soil has an available water holding capacity of 1 to 3 inches. Permeability is moderately rapid. Runoff is very rapid, and the hazard of erosion is moderate or severe. Effective rooting depth is shallow. Fertility is low.

This soil is used for wildlife, recreation, and watershed. Vegetation is mostly brush, but there are a few trees near the drainage channels or on north slopes. Capability unit VIIe–7 (15); range site, Shallow Gravelly Loam.

Maymen fine sandy loam, 15 to 50 percent slopes, eroded (MeF2).—This soil is along ridgetops and has an average slope of about 35 percent. Rock outcrops cover less than 5 percent of the surface.

Included with this soil in mapping are small areas of Ben Lomond fine sandy loam and Madonna loam.

The available water holding capacity of this soil is 1 to 3 inches. Runoff is medium to rapid, and the hazard of erosion is high. Effective rooting depth is 13 to 19 inches.

This soil is used mainly for limited range, wildlife, and watershed. A few acres on the lesser slopes have been cultivated to grain hay. A number of summer cabins and mountain homes have been built on this soil. Capability unit VIIe-8 (15); range site, Shallow Gravelly Loam.

Montara Series

The Montara series consists of somewhat excessively drained clay loams that are underlain by serpentine bedrock at a depth of 10 to 16 inches. These soils are on uplands and have slopes of 15 to 50 percent. Vegetation is annual grasses, forbs, and scattered dwarf oaks and Digger pines. Elevation ranges from 800 to 3,000 feet. Average annual rainfall is 16 to 25 inches, and average annual temperature is 58° to 60° F. The growing season is 200 to 275 days. Montara soils are associated with the Azule, Climara, and Inks soils.

In a representative profile, the soil is dark gray and very dark gray, moderately alkaline clay loam about 13 inches thick that is underlain by greenish gray serpentine bedrock. Rock outcrops cover 5 to 10 percent of the surface.

Montara soils are used mainly for range, wildlife, recreation, and watershed.

Montara rocky clay loam, 15 to 50 percent slopes, eroded (MwF2).—This soil is on broad, well-rounded ridges of the uplands. Average slope is about 30 percent.

Representative profile (in road cut 0.5 mile north of Pigeon Point; T. 8 S., R. 3 E.):

A11—0 to 2 inches, dark-gray (10YR 4/1) clay loam, black (10YR 2/1) moist; moderate, fine and medium, granular structure; hard, friable, sticky and plastic; few fine roots; many fine and very fine tubular pores; moderately alkaline (pH 8.0); clear, wavy boundary. (0 to 2 inches thick.)

A12—2 to 6 inches, very dark gray (10YR 3/1) clay loam, black (10YR 2/1) moist; moderate, medium, subangular blocky structure; hard, very friable, sticky and plastic; common, very fine roots; many very fine and fine tubular pores; moderately alkaline (pH 8.0); clear, wavy boundary. (4 to 6 inches thick.)

A13—6 to 13 inches, very dark gray (10YR 3/1) clay loam, black (10YR 2/1) moist; moderate, fine, subangular blocky structure; hard, friable, sticky and plastic; few very fine roots; common fine and very fine tubular pores; moderately alkaline (pH 8.0); abrupt, irregular boundary. (6 to 8 inches thick.)

R—13 inches, greenish-gray serpentine rock.

The A horizon is dark gray to very dark gray. Five to 10 percent of the surface is covered by rock outcrops. Depth to rock is 10 to 16 inches. Reaction is neutral to moderately alkaline and changes little with increasing depth.

Included with this soil in mapping are areas of Inks rocky clay loam and Rock land and areas of soils that are clay throughout the profile.

Available water holding capacity is 2 to 3 inches. Permeability is moderately slow. Runoff is medium to rapid, and the hazard of erosion is moderate to high. Fertility is low because of an unfavorable calcium-magnesium ratio. Effective rooting depth is shallow to bedrock.

This soil is used for range, wildlife, recreation, and watershed. Capability unit VIIe-9 (15); range site, Serpentine.

Pacheco Series

The Pacheco series consists of poorly drained clay loams that are underlain by sedimentary alluvium. These soils are on low alluvial plains and have slopes of less than 2 percent. The vegetation, where these soils are not cultivated, is annual grasses and forbs. Elevation ranges from 150 to 300 feet. Average annual rainfall is 16 to 20 inches, and average annual temperature is 58° to 60° F. The growing season is 250 to 275 days. Pacheco soils are associated with the Clear Lake, Yolo, and Willows soils.

In a representative profile, the surface layer is grayish-brown, moderately alkaline clay loam about 16 inches thick. In some places the surface layer is fine sandy loam or silt loam. The surface layer is underlain by mottled, light-gray, moderately alkaline loam and very fine sandy loam to a depth of more than 60 inches. In places the substratum is gravelly. The profile is calcareous in the lower part.

Pacheco soils are used for irrigated sugar beets, row crops, orchards, pasture, and hay.

Pacheco clay loam (Pd).—This soil is level and is in low positions on the alluvial plains. Average slope is less than 2 percent.

Representative profile (in a field 0.1 mile west of pump number 1 on Taix Company ranch):

Ap—0 to 7 inches, grayish-brown (10YR 5/2) clay loam, very dark grayish brown (10YR 3/2) moist; moderate, fine, granular structure; hard, friable, sticky and plastic; many fine interstitial pores and many fine tubular pores; moderately alkaline (pH 8.0); clear, smooth boundary. (6 to 8 inches thick.)

A1—7 to 16 inches, grayish-brown (10YR 5/2) clay loam, very dark grayish brown (10YR 3/2) moist; moderate, medium, subangular blocky structure; hard, friable, sticky and plastic; many fine interstitial and tubular pores; moderately alkaline (pH 8.0); clear, smooth boundary. (8 to 10 inches thick.)

C1g—16 to 35 inches, light-gray (10YR 6/1) loam, gray (10YR 5/1) moist; many, fine, distinct, brown (10YR 5/3) mottles, dark brown (10YR 4/3) moist; massive; hard, friable, nonsticky and nonplastic; moderately alkaline (pH 8.3); clear, smooth boundary. (18 to 25 inches thick.

C2g—35 to 60 inches, light-gray (10YR 6/1) very fine sandy loam, gray (10YR 5/1) moist; many, coarse, distinct, brown (10YR 5/3) mottles, dark brown (10YR 3/3) moist; massive; hard, friable, nonsticky and nonplastic; slightly calcareous, moderately alkaline (pH 8.0).

The A horizon is grayish brown to dark gray. Reaction is mildly alkaline to moderately alkaline. Texture is clay loam or silty clay loam. Structure is fine or medium granular or subangular blocky. The C horizon is light brownish gray, light gray, or gray and contains common to many mottles. It is stratified sandy loam to silty clay loam that averages between 10 and 40 percent clay and more than 15 percent sand. Mottling is generally present at an average depth of slightly more than 16 inches.

Included with this soil in mapping are small areas of Clear Lake clay and of soils similar to the Pacheco soils that are calcareous in the surface layer.

The available water holding capacity is 9 to 11 inches. Permeability is moderate. Runoff is very slow, and this soil is flooded about twice every 10 years. The hazard of erosion is none to slight. Fertility is moderate. Effective rooting depth is restricted to a depth of 36 to 50 inches by a seasonal water table.

C2gca—34 to 42 inches, gray (5Y 5/1) silty clay, dark gray (5Y 4/1) moist; many, fine, distinct, light yellowish-brown (2.5Y 6/4) mottles, light olive brown (2.5Y 5/4) moist; strong, medium, subangular blocky structure; hard, friable, sticky and plastic; few fine roots; many very fine interstitial and tubular pores; strongly calcareous, with many large, irregularly shaped, soft lime masses; moderately alkaline (pH 8.0); clear, smooth boundary. (8 to 10 inches thick.)

C3g—42 to 60 inches, light-gray (5Y 7/1) silty clay, gray (5Y 5/1) moist; many, fine, distinct, light yellowish-brown (2.5Y 6/4) mottles, light olive brown (2.5Y 5/4) moist; massive; hard, friable, sticky and plastic; many very fine interstitial and tubular pores; weakly calcareous; moderately alkaline (pH 8.0).

The A horizon is silty clay or heavy silty clay loam. The C horizon is typically gray to white, and texture is silty clay or silty clay loam. Lime is disseminated, but there are few to many lime masses and few to common hard lime concretions.

Included with this soil in mapping are some areas of Clear Lake clay and a few small areas that are strongly calcareous in the surface layer.

Available water holding capacity of this soil is 9 to 10 inches. Drainage has been improved because of the general lowering of the water table in the valley. Permeability is slow, and water sometimes is ponded during winter months. Runoff is very slow, and the hazard of erosion is none to slight. Fertility is high. Effective rooting depth is very deep.

This soil is used for irrigated row crops, sugar beets, prunes, and pears. Where orchard crops are grown, definite symptoms of chlorosis are present because of the lime content of the soil. Capability unit IIs–5 (14).

Sunnyvale silty clay (Su).—This nearly level soil has a profile similar to that of Sunnyvale silty clay, drained, but it has a seasonal water table at a depth of 30 to 60 inches. Near Tulare Hill this soil has been flooded twice in about 10 years.

Included with this soil in mapping are a few small areas that are highly calcareous, a few areas that are salty in the surface layer, about 5 acres of Pacheco silt loam, just south of Tulare Hill, and a few acres of Willows clay. About 20 acres of this soil has buried black clay at a depth of 2 to 3 feet.

Effective rooting depth of this soil is very deep but is restricted by the seasonal water table. Available water holding capacity is 9 to 10 inches where this soil is drained. Natural fertility is moderate.

This soil is used for irrigated row crops and pasture. Capability unit IIIw–5 (14).

Terrace Escarpments

Terrace escarpments (TeF) consists of areas of steep, old terraces and generally has slopes of 30 to 50 percent. This land type is associated with the Hillgate, Keefers, and Pleasanton soils. It has not developed distinct horizons, but it generally consists of material of gravelly loam or clay loam texture. Vegetation is mostly annual grasses, forbs, and scattered oak trees.

Runoff is rapid, and the hazard of erosion is high.

This land type is used for limited range, wildlife, and watershed Capability unit VIIe–1 (15); range site, Loamy.

Vallecitos Series

The Vallecitos series consists of well-drained loams that are underlain by sedimentary and metasedimentary bedrock at depths of 13 to 30 inches. These soils are on uplands and have slopes of 15 to 75 percent. Vegetation is annual grasses, forbs, and oak trees. Elevation ranges from 300 to 3,500 feet. Average annual rainfall is about 16 to 25 inches, and average annual temperature is about 58° to 60° F. The growing season is about 200 to 250 days. Vallecitos soils are associated with the Gaviota and Los Gatos soils.

In a representative profile, the surface layer is brown, slightly acid and medium acid loam about 10 inches thick. The subsoil is dark-brown and reddish brown, medium acid clay loam and clay. It is underlain at a depth of 19 inches by bluish-gray metamorphosed shale. Rock outcrops cover 2 to 10 percent of the surface.

Vallecitos soils are used for range, wildlife, recreation, and watershed.

Vallecitos rocky loam, 15 to 30 percent slopes, eroded (VaE2).—This soil is in large areas of steeper soils on hills that have broad, rounded ridges. Slopes average slightly less than 30 percent.

Representative profile (175 feet west from intersection of the county line road from Pacheco Pass Highway):

A11—0 to 2 inches, brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; massive; hard, friable, nonsticky and nonplastic; many very fine roots; many very fine interstitial and tubular pores; slightly acid (pH 6.5); clear, smooth boundary. (1 to 2 inches thick.)

A12—2 to 10 inches, brown (7.5YR 5/4) loam, dark brown (7.5YR 3/2) moist; massive; hard, friable, nonsticky and nonplastic; few very fine roots; many very fine interstitial and tubular pores and few fine and medium tubular pores; medium acid (pH 6.0); abrupt, smooth boundary. (7 to 8 inches thick.)

B1t—10 to 16 inches, dark-brown (7.5YR 4/4) clay loam, dark reddish brown (5YR 3/4) moist; massive; hard, friable, slightly sticky and slightly plastic; few fine roots; many very fine interstitial and tubular pores and few fine and medium tubular pores; common thin clay films on bridges between sand grains and clay films in pores; medium acid (pH 6.0); abrupt, broken boundary. (0 to 8 inches thick.)

B2t—16 to 19 inches, reddish-brown (5YR 5/3) clay, dark reddish brown (5YR 3/3) moist; moderate, medium, subangular blocky structure; very hard, firm, sticky and plastic; many very fine and fine tubular pores; continuous, moderately thick clay films on ped surfaces and in pores; medium acid (pH 6.0); abrupt, broken boundary. (0 to 12 inches thick.)

R—19 inches, bluish-gray, metamorphosed shale.

The A horizon is brown or grayish brown. Reaction is medium acid to neutral. The texture is loam or light clay loam. Rock outcroppings cover 2 to 10 percent of the surface. The B2t horizon is typically reddish brown but ranges to dark brown or dark reddish brown. Reaction is medium acid to neutral. The texture is clay loam or clay. The Bt horizon is missing in places or is only in fracture planes of the bedrock. Depth to bedrock is 16 to 30 inches.

Included with this soil in mapping are similar soils that have a brown subsoil, small areas of Rock land, areas that have been subject to severe sheet and rill erosion, and small areas of Montara rocky clay loam and Gaviota rocky loam. Also included are areas along drainageways where slopes range up to 45 percent, a few areas of a gray, moderately alkaline soil, and areas that have soft serpentine shale at a depth of 4 feet or more.

The available water holding capacity is 3 to 6 inches, depending on depth to bedrock. Permeability in the subsoil is slow. Runoff is medium to rapid, and the hazard of erosion is moderate to high. Natural fertility is moderate. Effective rooting depth is shallow to moderately deep to bedrock.

This soil is used for range. Natural vegetation is mostly grasses, forbs, and scattered oak trees. The surface over much of the area is crusted from being trampled by livestock. Capability unit VIe-7 (15); range site, Shallow Loamy.

Vallecitos rocky loam, 50 to 75 percent slopes, eroded (VaG2).—This soil is on uplands that have narrow, somewhat angular to rounded, winding ridgetops. Slopes generally range from 50 to 60 percent. This soil has a profile similar to that of Vallecitos rocky loam, 15 to 30 percent slopes, eroded, but it is more shallow. It averages about 16 inches to bedrock but ranges from 13 to 24 inches.

Included with this soil in mapping are some areas of Gaviota rocky loam and, on the north slopes, Los Osos clay loam.

The available water holding capacity is 2 to 5 inches. Runoff is very rapid, and the hazard of erosion is very high.

This soil is used for range, wildlife, recreation, and watershed. Natural vegetation is generally grasses, forbs, and scattered oak and Digger pine trees, but some of the more eroded areas have a thin brush cover. Capability unit VIIe-7 (15); range site, Shallow Loamy.

Willows Series

The Willows series consists of poorly drained clays that are underlain by alluvium from material derived from sedimentary rock. These soils are in low positions on the alluvial plains and have slopes of less than 2 percent. The vegetation, where these soils are not cultivated, consists of saline-alkali tolerant grasses and forbs. Elevation ranges from 100 to 400 feet. Average annual rainfall is 16 to 20 inches, and average annual temperature is 58° to 60° F. The growing season is about 250 to 275 days. Willows soils are associated with the Clear Lake and Pacheco soils.

In a representative profile, the surface layer is dark-gray, moderately alkaline, calcareous clay about 12 inches thick. The substratum is mottled, olive-gray and light olive-gray, strongly alkaline, calcareous clay to a depth of 60 inches or more. Deep cracks develop in the surface layer and upper part of the substratum when these soils are dry. The soils contain slight to moderate concentrations of soluble salts and alkali salts.

Willows soils are used for irrigated row crops and pasture.

Willows clay (Wa).—This soil is in low positions on alluvial plains. It has no well-defined drainage channels. Slopes are less than 2 percent.

Representative profile (south on Frazer Lake Road, 3/8 of a mile from Bloomfield Avenue intersection and 3/8 of a mile north into field, toward the Pajaro River):

Ap—0 to 6 inches, dark-gray (5Y 4/1) clay, very dark gray (5Y 3/1) moist; moderate, medium and fine, granular structure; very hard, firm, sticky and very plastic; few very fine and medium roots; many very fine interstitial and tubular pores and few medium tubular pores; slightly calcareous, moderately alkaline (pH 8.0); abrupt, smooth boundary. (4 to 7 inches thick.)

A1—6 to 12 inches, dark-gray (5Y 4/1) clay, very dark gray (5Y 3/1) moist; few, fine, distinct, light brownish-gray (2.5Y 6/2) mottles, light olive brown (2.5Y 5/4) moist; strong, coarse, angular, blocky structure; extremely hard, very firm, sticky and very plastic; many very fine roots and few medium roots; many very fine interstitial and tubular pores and few medium tubular pores; many intersecting slickensides; slightly calcareous, moderately alkaline (pH 8.0); clear, smooth boundary. (6 to 8 inches thick.)

C1ca—12 to 31 inches, olive-gray (5Y 5/2) clay, dark olive gray (5Y 3/2) moist; many, fine, distinct, brown (10YR 5/3) mottles, dark brown (10YR 4/3) moist; strong, coarse, prismatic structure; extremely hard, very firm, sticky and very plastic; common very fine and medium roots; many very fine interstitial and tubular pores and few medium tubular pores; many intersecting slickensides; strongly effervescent, with lime in seams and soft masses; few medium-sized gypsum crystals lining some pores; strongly alkaline (pH 8.5); clear, smooth boundary. (18 to 25 inches thick.)

C2—31 to 60 inches, light olive-gray (5Y 6/2) clay, olive gray (5Y 5/2) moist; common, fine, distinct, brown (10YR 5/3) mottles, dark brown (10YR 4/3) moist, and few, medium, distinct, gray (5Y 5/1) mottles; massive; very hard, firm, sticky and plastic; many very fine interstitial and tubular pores and few medium tubular pores; many intersecting slickensides in the upper 10 inches; strongly effervescent; strongly alkaline (pH 8.5).

The A horizon is commonly dark gray or dark grayish brown. Lime is generally present. Few to many medium-sized salt crystals commonly are in the A and C horizons. When this soil is dry, deep cracks develop that ordinarily are 1/2 to 1 1/2 inches in width. The C horizon is olive gray, light olive gray, or light yellowish brown. Distinct mottles start at an average depth of 12 inches and are light brownish gray, brown, or gray.

Included with this soil in mapping are some areas of Clear Lake clay and a few areas of a soil that has 2 to 5 percent slopes. About 20 percent of this acreage is covered by overwash material, 10 to 20 inches thick, of sandy clay loam texture.

The natural fertility of this soil is affected by moderate concentrations of soluble salts. Effective rooting depth is restricted by a water table that fluctuates seasonally between depths of 20 and 40 inches. The soil generally is ponded during winter. The available water holding capacity is 6 to 7.5 inches. Permeability is slow, and erosion is not a problem.

This soil is used mostly for pasture. A few areas are used for irrigated row crops. Capability unit IVw-6 (14).

Yolo Series

The Yolo series consists of well-drained loams that are underlain by alluvium from sedimentary rock. These soils are on alluvial plains and fans and have slopes of 0 to 9 percent. The vegetation, where these soils are not cultivated, is mainly annual grasses and forbs, and there are a few scattered oak trees. Elevation ranges from 400 to 2,400 feet. Average annual rainfall is 15 to 25 inches, and average annual temperature is 58° to 60° F. The growing season is about 250 to 275 days. Yolo soils are associated with the Campbell, Esparto, and Zamora soils.

In a representative profile, the surface layer is grayish-brown, neutral and mildly alkaline loam about 29 inches thick. The substratum is brown, mildly alkaline silt loam to a depth of 60 inches or more. In some places the surface layer is silty clay loam.

NOTE

Oversized Sheets Have Not Been Included

CALIFORNIA TIGER SALAMANDER AND WESTERN POND TURTLE MITIGATION PLAN
LION'S GATE PROJECT, SANTA CLARA COUNTY, CALIFORNIA

December 1995

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INTRODUCTION

BACKGROUND

This document describes a plan to mitigate impacts to the California tiger salamander (*Ambystoma californiense*) and western pond turtle (*Clemmys marmorata*) resulting from development of the Lion's Gate project. The presence of California tiger salamanders and western pond turtles was documented by H. T. Harvey & Associates (1992, 1994) and during field surveys conducted by LSA during 1995.

SITE LOCATION

The proposed Lion's Gate Development is located in the Hayes Valley south of Morgan Hill, Santa Clara County. Portions of the project site are bordered to the to the west by Watsonville Road and to the east by Coolidge Avenue and Turlock Avenue. Figures 1 and 2 show the regional location and project vicinity, respectively.

SITE DESCRIPTION

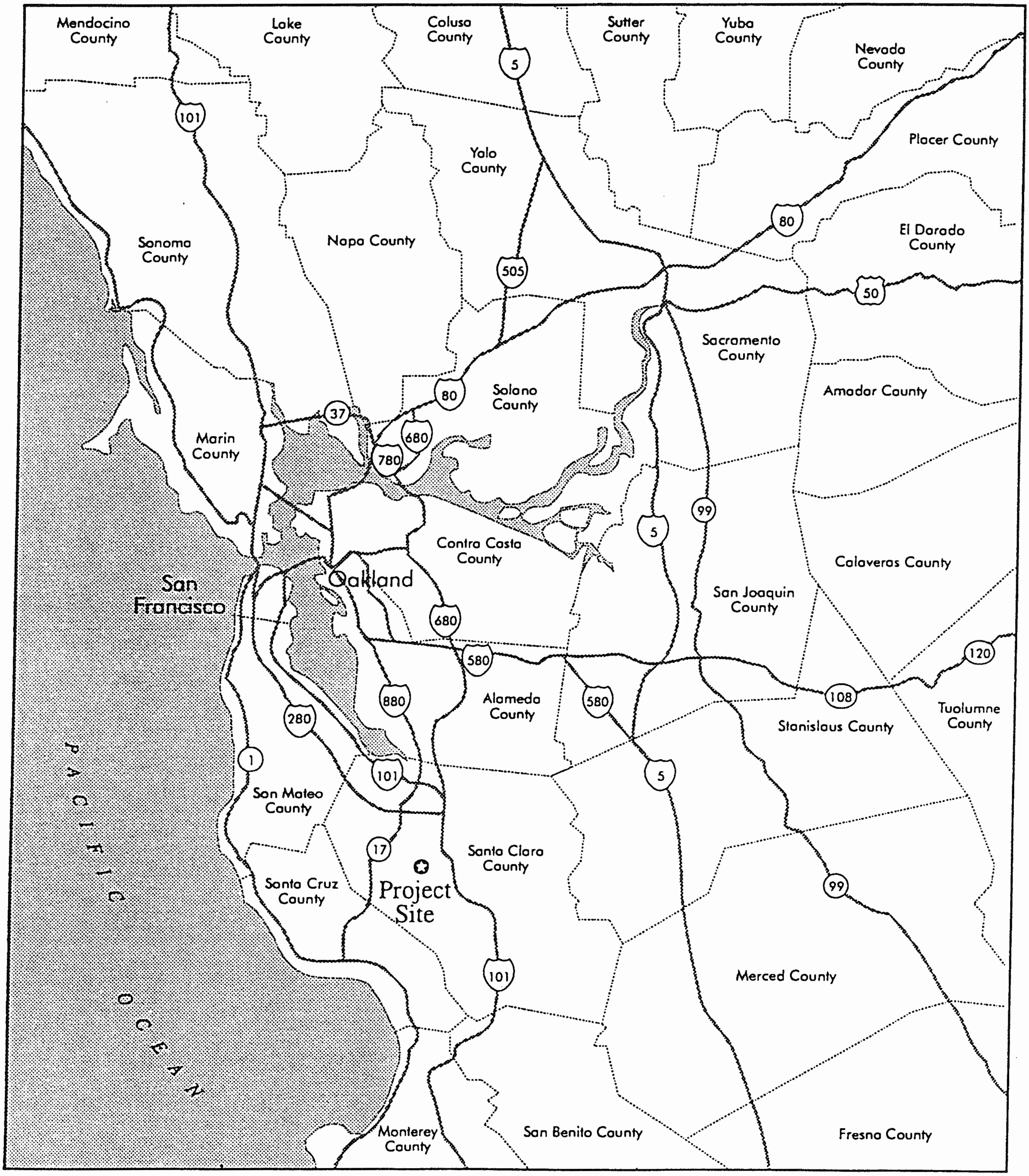
The approximately 1,676-acre project site consists of a series of hills to the north and south of Hayes Valley, which forms the central portion of the property. Elevations range from 1,117 feet above sea level at Lion's Peak at the southern extremity to approximately 300 feet on the floor of Hayes Valley. The headwaters of the West Branch of Llagas Creek, an intermittent stream, flow eastward through Hayes Valley and off the site. Several drainages tributary to the West Branch of Llagas Creek are present on the site. Seven stock ponds are present on the property (Figure 3).

The vegetation on the project site is primarily non-native grassland and valley oak woodland. Diablan sage scrub and valley oak/sycamore riparian woodland also grow here.

The majority of the site is currently used for cattle grazing and is undeveloped. Several residences are located at the eastern edge of the property off Highland Avenue. The southeastern corner of the site is an orchard and agricultural field.

PROPOSED DEVELOPMENT

The proposed project consists of residential development and golf course. The 41 residential units are planned at the eastern end of the development (Figure 3). The golf course is located west of and adjacent to the residential development.



03-28-95(HVD501)

Figure 1

N

LSA

Scale in miles

0 20

Regional Location

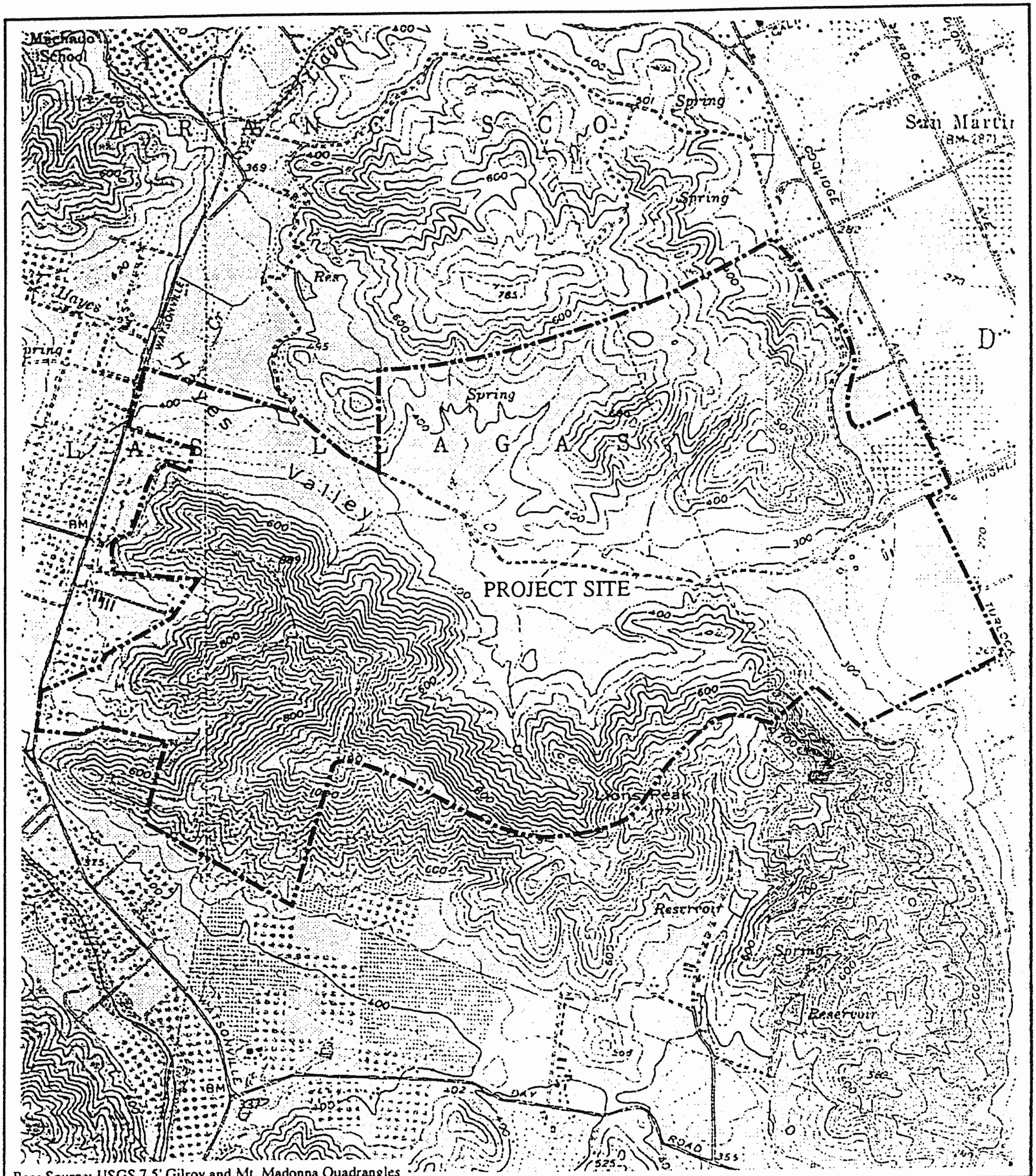


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Figure 2

N

LSA

Scale in feet
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Site Location

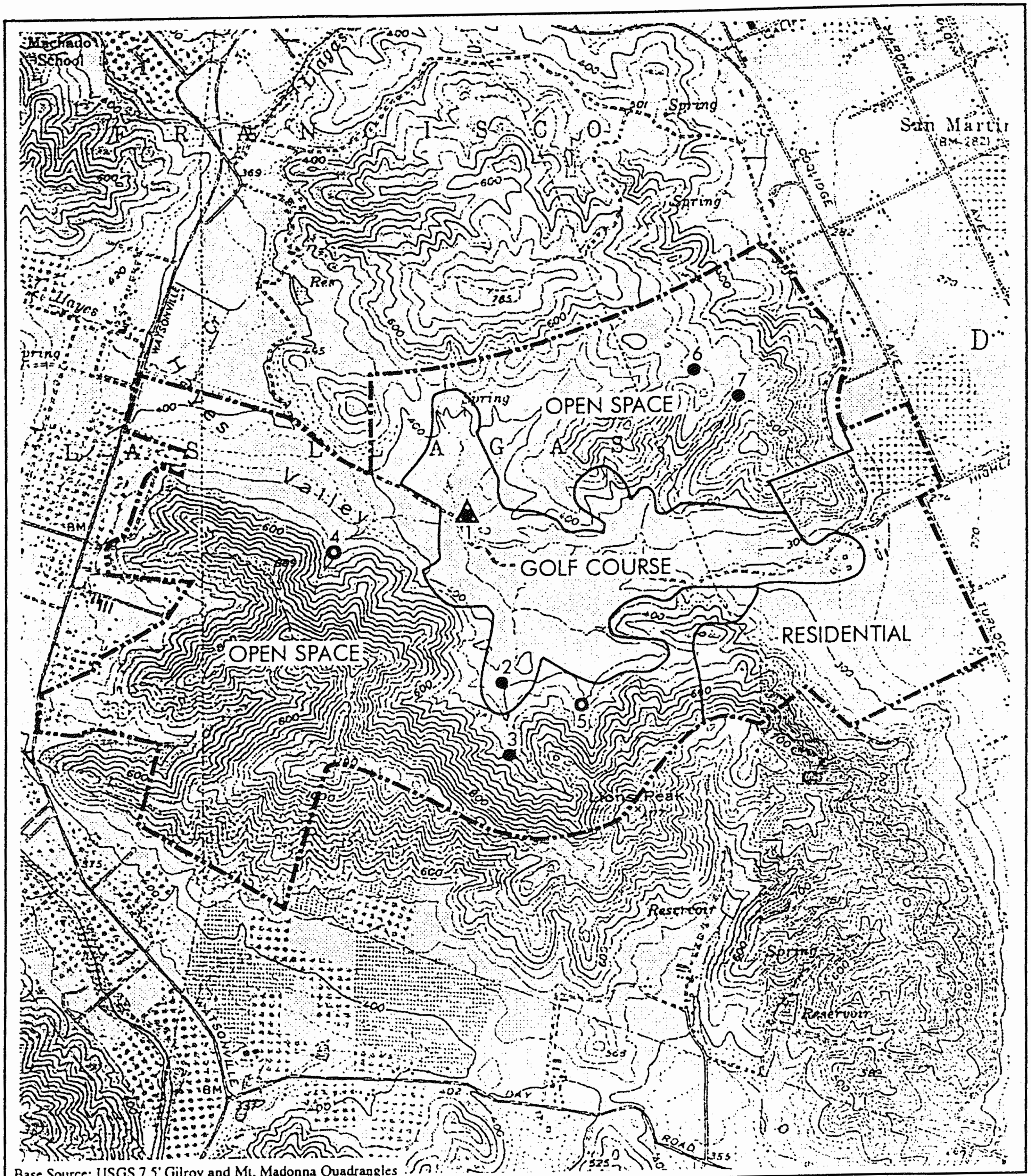

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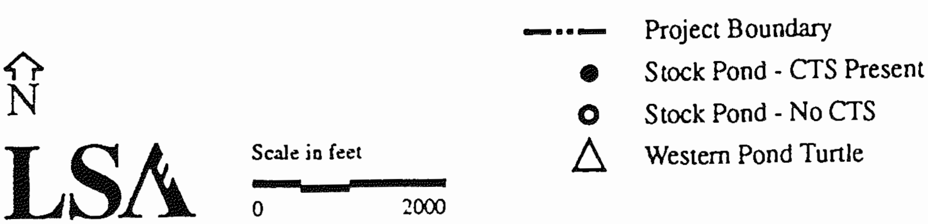
Figure 3



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Location of Stockponds

BIOLOGY OF CALIFORNIA TIGER SALAMANDER

STATUS

The California tiger salamander (CTS) is a federal Category 1 candidate species and a state Species of Special Concern. A petition to list the California tiger salamander was filed with the U. S. Fish and Wildlife Service (USFWS) on February 20, 1992, by Dr H. Bradley Shaffer of UC Davis. A 90-day finding announced that the petition presented substantial information indicating the requested action may be warranted and a formal review of the species commenced. The twelve month finding announced that listing has been found to be warranted but precluded by pending listing actions of higher priority species. The California tiger salamander was given a listing priority number of 8. The USFWS continues to seek data and comments from the public on the status and threats to this animal.

The California Department of Fish and Game Natural Diversity Data Base includes the salamander on its list of species of special concern. The Department of Fish and Game identifies species of special concern as those whose populations are declining and are being monitored to determine if they warrant future listing.

DISTRIBUTION

The California tiger salamander occurs in central California from the Sacramento Valley south to Santa Barbara (Stebbins 1985). The actual occurrence of the species within this range is restricted to locations where breeding ponds are surrounded by suitable upland habitat. In the vicinity of the project site, CTS have been recorded from the Chesbro Reservoir watershed to the north and from the O'Connell Ranch to the south (CNDDB 1994).

HABITAT

California tiger salamanders inhabit grassland, savanna, and deciduous oak woodland with a grassland understory near breeding sites. Tiger salamanders breed primarily from December through February. Suitable breeding sites include vernal pools and stock ponds, and bermed drainages. Optimal breeding habitat is in temporary ponds in which predatory fish and bullfrog are absent. Fish feed on eggs and larvae of California tiger salamander. Post metamorphic bullfrogs are known to prey on larvae of this salamander.

LIFE HISTORY

Adult tiger salamanders are terrestrial and spend the majority of their life below ground in rodent burrows, such as those of California ground squirrels (*Spermophilus beecheyi*) and California pocket gopher (*Thomommys bottae*).

During the breeding season, California tiger salamanders emerge from their burrows and migrate to breeding sites. They are known to travel considerable distances (up to .75 miles or more) from the burrows to the breeding site. This migration occurs at night during or after rains. After breeding, the adult salamanders remain at the breeding site for one to four months foraging and then travel back to their burrows and remain there until the next rainy season.

California tiger salamander larvae can be one of the dominant aquatic organisms during years of successful breeding. Larvae of the California tiger salamander spend 2 - 4 months in the water, transforming to the adult stage at a size of about three inches. Depending on when the eggs are laid, larvae usually metamorphose between May and July. After metamorphosis, juvenile salamanders leave the pond and seek burrow sites.

Both the adults and larvae of the California tiger salamander are carnivorous. Larval salamanders prey on aquatic invertebrates, tadpoles, and occasionally on small fish. Their invertebrate prey includes back-swimmers, copepods, fairy shrimp, seed shrimp, annelid worms and flat worms. The prey of adult tiger salamanders is likely to include insects, worms, and small frogs, toads, and salamanders.

LOCATION OF SALAMANDER HABITAT ON THE PROJECT SITE

Seven stock ponds are located on the Lions Gate project site (Figure 3). CTS were found in five of these. Stock ponds on the project site range from 675-37,030 sq. feet in size (LSA 1994). California tiger salamanders were found in stock ponds 1, 2, and 3 during special status species surveys in 1992 (H.T. Harvey & Associates 1992). California tiger salamanders were found in ponds 1, 2, 6, and 7 during field surveys conducted by LSA during 1995. Stock ponds 4 and 5 appear to provide suitable breeding habitat for tiger salamanders, but none were found during the surveys. Ponds 3, 4, 5, 6, and 7 are within project open space.

Grassland and oak savanna with ground squirrel colonies are adjacent to the breeding ponds and provide the second essential component of salamander habitat.

In addition to tiger salamanders, other amphibians breed in the stock ponds, including western toad (*Bufo boreas*) and Pacific tree frog (*Pseudacris regilla*).

PROJECT IMPACTS

1. Direct Mortality

- An undeterminable number of adult CTS may be lost during grading.
- Salamanders migrating to or from breeding ponds could be run over by cars or other vehicles traveling on the proposed access road from Watsonville Road to the maintenance facility or other paved roadways within the property.
- Adult salamanders or larvae in the water storage lake could be lost during pumping or the drawdown of the water level in the lake

2. Loss or Degradation of Breeding Habitat

- The project proposes to fill pond 2 and incorporate the area within the golf course.
- Pond 1 will be left intact but its suitability as breeding habitat for CTS could be reduced. The construction of a permanent lake approximately 400 feet from Pond 1 where bullfrog could become established increases the possibility of these predators moving to Pond 1 when water is present. Their presence would reduce the CTS population over time.

3. Loss of Upland Habitat

- Approximately 100 acres of upland habitat will be permanently lost due to golf course development. Areas of annual grassland will be left intact within the golf course and may provide suitable upland habitat as long as estivation sites (burrows, especially of ground squirrels) are not removed.

4. Reduction of Water Quality

- Irrigation runoff from the golf course may contain levels of pesticides, fertilizers and herbicides which if they enter Pond 1 may be toxic to CTS and other aquatic species.

BIOLOGY OF THE SOUTHWESTERN POND TURTLE

STATUS

The western pond turtle (*Clemmys marmorata*) is a federal category 2 candidate species and a California species of special concern. A petition to consider this species for formal listing as threatened or endangered was filed with the USFWS in January, 1992. This petition was found by the service to present substantial information indicating that listing may be warranted. The USFWS then conducted a formal review of the status of the species and found that listing the western pond turtle as threatened or endangered was not warranted (U.S. Department of the Interior 1993).

DISTRIBUTION

The western pond turtle is distributed discontinuously from Puget Sound, Washington southward to Baja California, Mexico. (Stebbins 1985). Two subspecies are currently recognized. The southwestern pond turtle (Clemmys marmorata pallida) occurs discontinuously from the vicinity of Monterey Bay southward and the northwestern pond turtle occurs from the Sacramento Valley northward. A zone of intergradation between these two subspecies occurs in the Central Valley of California from the San Francisco Bay south to the Transverse Ranges (Stebbins 1985).

HABITAT

Pond turtles use permanent or nearly permanent waterbodies in a variety of habitat types. They can be found in ponds, marshes, rivers, streams, and irrigation ditches within grasslands, woodlands, and open forests. Holland (1991) found that the quality of the habitat seemed to vary with the availability of aerial and aquatic basking sites. Pond turtles reach higher densities where many aerial and aquatic basking sites are available (Jennings and Hayes 1994). Logs, rocks, mats of floating vegetation, or open mud banks are used for basking and are necessary for thermoregulation. Pond turtles also require upland habitat for overwintering and egg-laying sites. Egg-laying sites are found in upland areas and may be near or far from the aquatic site.

LIFE HISTORY

Pond turtles are often seen sunning themselves along banks and on logs during the spring. When disturbed, they will drop into the water and hide under rocks, logs or other debris. Their gray mottled coloration allows them to blend in with their surroundings, making it difficult to distinguish them from bottom substrate.

Pond turtles feed on a variety of food items including crustaceans, fish, carrion, and plant material. The diet of the pond turtle in most areas consists of small and medium-sized invertebrates (Holland 1991), including larvae of amphipods, odonates, chironomids, coleopterans, and mysidacean (Holland 1985).

Breeding occurs in spring and early summer. Eggs may be laid from April through August (Stebbins 1985). Female usually leave the waterbody in late afternoon or early evening and typically construct nests 10-190 m from the waterbody (Holland 1991). Hatchlings are thought to hatch and overwinter in the nest (Holland 1985), moving to aquatic sites in the spring (Jennings and Hayes 1994).

LOCATION OF WESTERN POND TURTLES ON THE PROJECT SITE

At least five western pond turtles were observed at Pond 1 during special status species surveys in 1992 (H.T. Harvey and Associates 1992). One western pond turtle was captured and two others observed at Pond 1 during LSA surveys in 1995. The creek and other stock ponds on the site also provide suitable habitat for the pond turtle.

PROJECT IMPACTS

1. Direct Mortality

- Construction and grading activity for the creation of the golf course may result in direct mortality to pond turtles using upland areas and the loss of existing nesting sites during grading activities.

- Direct mortality to females attempting to move to nesting sites and/or hatchlings moving to aquatic sites may occur if they move into the golf course after it is completed.

- Pond turtles would be subject to increased collection pressures due to the increased number of people using the area.

2. Loss of Upland Nesting and Overwintering Habitat

- Approximately 100 acres of potential upland nesting and overwintering habitat will be permanently lost due to golf course development.

3. Disturbance of Activity

- Human activity in close proximity to the pond may disturb normal pond turtle activities (e.g., basking and foraging).

4. *Reduction of Water Quality*

- Water quality may be reduced by irrigation runoff from the golf course. Affected areas may include Pond 1 and reaches of the creek which are adjacent to or downstream of the golf course.

5. *Introduction of Exotics*

- The possible introduction of exotic predatory species such as bullfrog and fish into waterbodies on the project sites will increase.

MITIGATION

CALIFORNIA TIGER SALAMANDERS

Direct Mortality

Measures will be taken to reduce direct mortality of terrestrial salamanders during construction and during migrations to and from breeding ponds after construction is completed.

Fencing will be erected to enclose areas to be graded in the vicinity of Ponds 1 and 2 in the fall of the year prior to the beginning of grading. The fence will be designed so that salamanders estivating within the construction areas can move out of their burrows and leave the fenced area to reach breeding ponds, but cannot return to burrows within the fenced construction areas. Adults and the years metamorphosed juveniles will be forced to choose burrow sites outside the construction areas.

To reduce road mortality, the proposed road to the golf course maintenance area (and secondary project emergency access) from Watsonville Road will be built without curbs and gutters. This will prevent salamanders from becoming trapped on the road if they should migrate onto the roadway.

The property boundary will be fenced to prevent trespass by unauthorized off-road vehicles.

Habitat Preservation and Creation

The project preserves three existing CTS breeding ponds (Ponds 3, 6 and 7) in permanent open space, maintains one breeding pond within the golf course (Pond 1), and creates three additional breeding ponds in permanent open space (Figure 4). The length of Llagas Creek and other drainages on the site will be preserved which will provide corridors between aquatic sites. Suitable upland habitat for the tiger salamander will be preserved with each aquatic site.

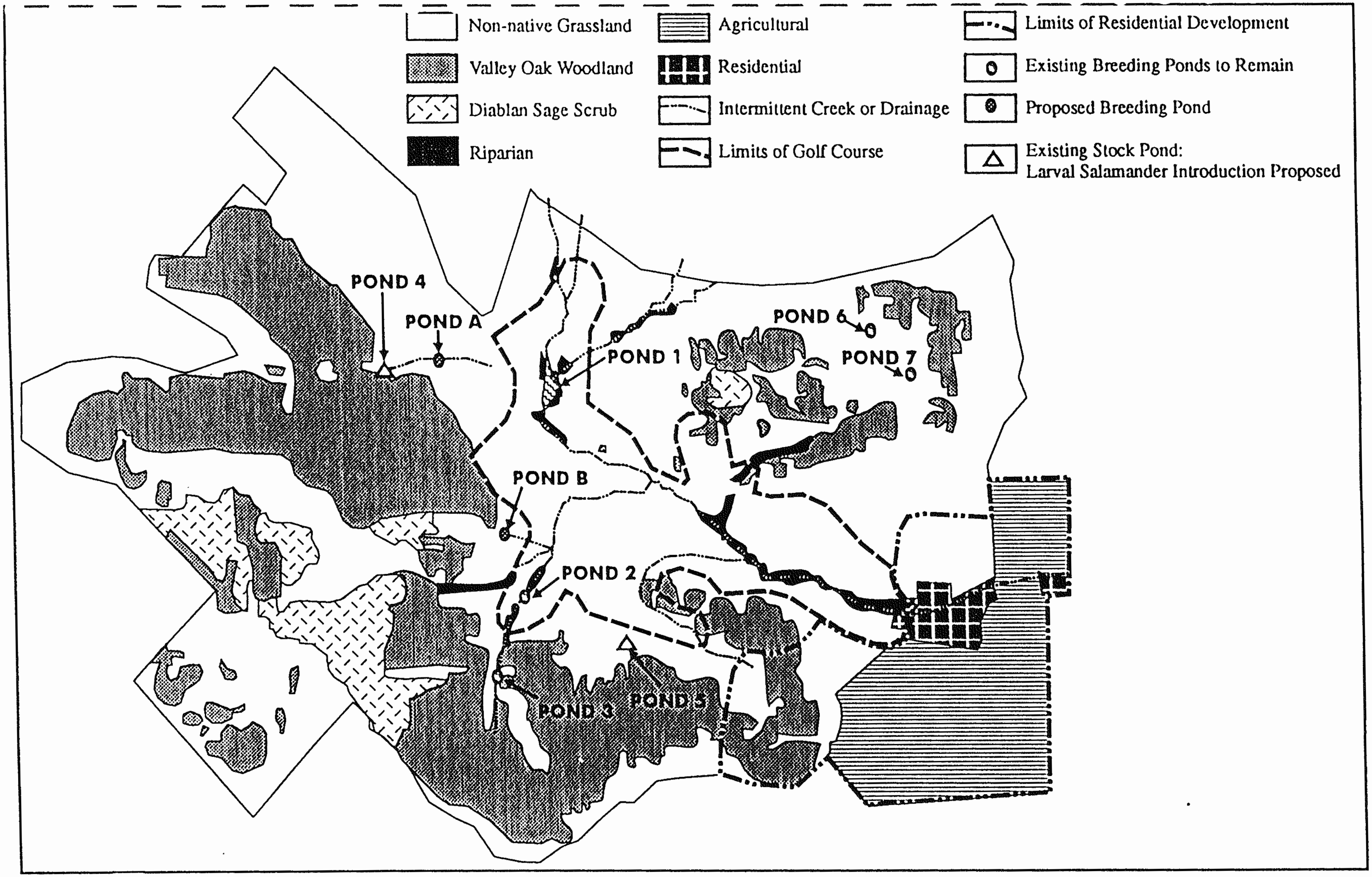

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Figure 4

LSA

Proposed Salamander Mitigation

Salamander Habitat Areas

Breeding Habitat

Breeding habitat for the CTS will consist of six existing ponds and three newly created ponds.

Existing Breeding Habitat

Pond 1 is an approximately 37,000-square-foot stock pond. Holes 3 and 5 of the golf course will be constructed adjacent to this pond. The pond will be managed to continue its suitability as breeding habitat for CTS. The hydrology of this pond will not be changed. A minimum buffer of 50 feet of undisturbed grassland will remain around the pond.

Pond 3 is an existing stock pond within the proposed open space. It has an area of approximately 9,800 square feet. This pond is located at the edge of suitable CTS upland habitat. The area to the south is steep woodland and scrub. The area to the north of the pond is suitable upland habitat - grassland/savanna with ground squirrel burrows. CTS larvae were found in this pond in 1992.

Ponds 6 and 7 are existing stock ponds within project open space. The areas of these ponds are approximately 1,650 and 1,000 square feet respectively. Both are ephemeral ponds and are associated with suitable upland habitat.

Proposed Breeding Habitat

No CTS larvae were found in Ponds 4 and 5 during surveys in 1995, but these ponds appear to provide suitable breeding habitat. CTS larvae from the pond to be filled (Pond 2) will be introduced into Ponds 4 and 5. This activity will occur in spring 1996. CTS larvae from Pond 1 will be introduced to this pond in spring 1997.

Two ponds, each having a surface area of approximately 10,000-square-feet, are proposed to compensate for the loss of CTS breeding habitat on the project site. Both proposed breeding ponds will be in permanent project open space and will be created by placing berms in separate drainages. Pond A will be located approximately 1,000 feet west of Pond 1 and Pond B will be located approximately 1800 feet southeast of pond 1 (Figure 4). The location of Pond B is approximately 500 feet west of the pond to be filled by the project (pond 2). Larvae will be introduced into Ponds A and B during the late winter and early spring of the second and third years following construction of the ponds.

Introducing California tiger salamanders to Ponds 4, 5, A and B will ensure that populations are established in these breeding ponds.

The introduction of California tiger salamander larvae will be done when the larvae are small in order for them to become acclimated to their new environment. Larvae will be collected in the first year of introductions by seining Pond 2 which is planned to be filled. Larvae for later introductions will come from occupied ponds in project open space. Fifty to one hundred larvae per year will be transplanted to each pond designated as a transplant site.

Upland Habitat

All existing and proposed breeding ponds are located adjacent to or are within suitable upland California tiger salamander habitat. Grassland is the primary habitat type and ground squirrels are common in all of these areas. The following management practices will be followed in the areas of upland habitat.

1. The vegetation will be managed to maintain all areas of existing grassland within the designated areas of upland salamander habitat. Woody plants which become established will be removed by hand. Grass height and density will be maintained by a yearly program designed to retain conditions suitable for use by California ground squirrels. The preferred method will be grazing by cattle (except within the golf course) because grazing minimizes thatch buildup and increases turbidity in the ponds, which helps to conceal salamander larvae from predators. Grazing will not be allowed to begin before April 1 and must end by September 30 of any year. The level of grazing will be moderately heavy, with a plant residue of 2-3 inches in height remaining (residual dry matter of 400 lbs/acre).

2. Ground squirrel populations within the designated upland salamander habitat areas will be protected. No control measures will be allowed in designated habitat areas. Designated habitat areas include all designated permanent open space and all non-native grassland areas within the golf course west of the Club House site.

3. The use of pesticides, herbicides, or fertilizers will not be allowed in designated habitat areas.

WESTERN POND TURTLE

Census Pond Turtle Population

A census of the pond turtle population will be conducted to ensure that relevant information on the population can be gathered during the monitoring period to determine if performance criteria have been met at the end of the monitoring period. All pond turtles on the project site, to the extent possible, will be captured by hand or with long handled dipnets from shore or by snorkeling. Capture records will be compiled that will include date and time of capture, location of capture, method of capture, sex, weight, carapace and plastron length, an estimate of age based on carapace length and number of annular rings, and length of time captive is held before release. Each turtle will be given a unique temporary and permanent mark. Temporary marks will be made on the second and third vertebral scutes posterior to the head with a water-based enamel paint. A permanent mark will be made by notching the marginal scutes with a rasping file to a depth of approximately 75 percent of the depth of the scute. The results of the pre-construction mark and release program will be provided to FWS and CDFG. The mark and release program will be conducted by qualified herpetologists who possess required state and/or federal permits.

Restriction of Movement into Construction Areas

Impacts to pond turtles will be minimized by excluding turtles from construction areas with temporary fencing barriers.

Western Pond Turtle Habitat Areas

Existing Habitat

The only location known to be inhabited by pond turtles is Pond 1. The Llagas Creek drainage downstream of Pond 1 and the tributaries feeding Pond 1 also provide seasonal habitat when water is present.

Pond 1 is an approximately 37,000-square-foot stock pond. It will be within the golf course after site development but will be managed to continue its suitability as aquatic habitat for western pond turtles. The hydrology of this pond will not be changed. A minimum buffer of 50 feet will be retained around the perimeter of the pond, which will be an out-of-bounds area for the golf course.

Proposed Habitat

Additional aquatic habitat for western pond turtles is proposed in the permanent open space north of the golf course (Figure 5). A 10,000-square-foot pond will be created by berming the eastern drainage channel that flows into Pond 1. This pond will be designed to dry by October in a year of average rainfall. Aerial basking sites will be provided as well as shallow areas with emergent vegetation for hatchling and juvenile turtles. The new pond will be fenced to keep cattle out.

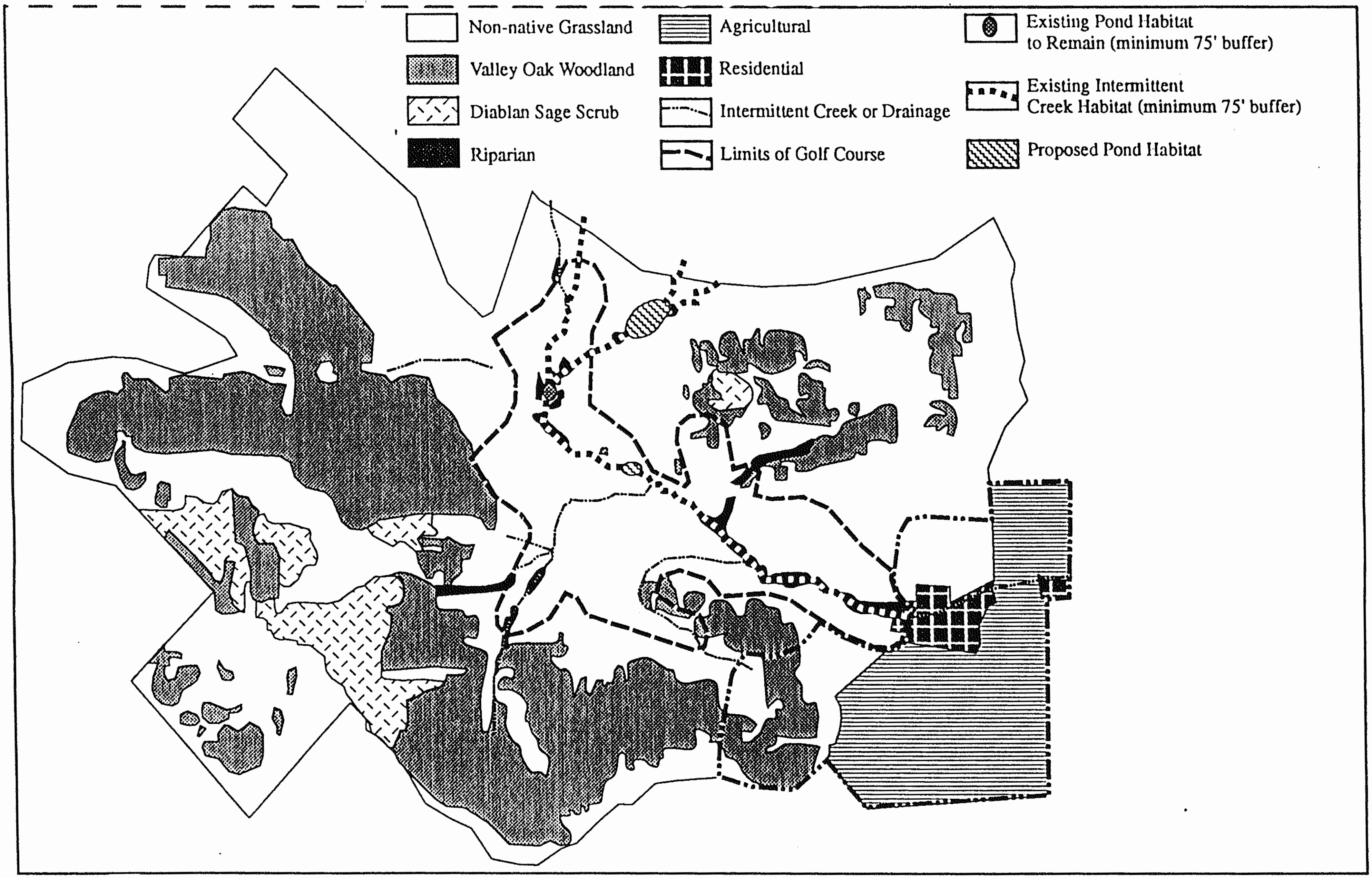

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Figure 5

LSA

Proposed Western Pond Turtle Mitigation

MONITORING PLAN

Monitoring will consist of an examination of site conditions to ensure the suitability of the Lion's Gate property as habitat for California tiger salamanders and western pond turtles. This will require examination of these species' aquatic and upland habitat as well as monitoring the numbers of larval salamanders and pond turtle populations.

MONITORING ACTIVITIES

Larval Salamander Abundance

The breeding sites of California tiger salamanders will be sampled by dip net or seine net for salamander eggs and larvae. After the first rains of the season that fill the ponds, the ponds will be examined for the presence of eggs. This usually will occur between November and March. The presence of eggs indicates the relative time of the initiation of breeding. Approximately one month later the larvae should be of sufficient size to capture. The ponds will be sampled by dipnet or seine on a monthly basis to determine whether larvae are present. Larval sampling will usually occur during the months of December through May.

The ponds will also be sampled for invertebrates and tadpoles to determine the available prey base for larval salamanders. The target of the mitigation plan is that the new ponds will have a prey base similar to that of the existing ponds.

Pond Turtle Populations

A mark and release program will be undertaken to document the pre-construction population of pond turtles, as described previously. This will allow for meaningful data on population trends and recruitment to be collected during the monitoring period.

Surveys for the western pond turtle will be conducted once a month from March through September. During each survey the following will be recorded:

1. The location of each pond turtle observed.

2. Whether or not the turtle is marked. If marked, its mark will be recorded. If not, an attempt to capture and mark and release will be made.

3. The type of habitat each turtle is using.

4. Any behavioral observations will also be noted.

Aquatic Habitat

The environmental conditions of the ponds will be monitored to ensure that the habitat remains suitable for the target species. Data will be collected on water depth, temperature, turbidity, concentration of dissolved solids for the duration of ponding, vegetative characteristics, vertebrate and invertebrate species present. These data will be collected from each of the breeding ponds. In addition, the ponds will be examined for the presence of bullfrogs (*Rana catesbiana*) and trash. Photographs will be taken from a fixed position and in the same direction to document the condition of the ponds.

The following will be measured on each monitoring visit to the Lion's Gate site:

1. Water depth
2. Water temperature
3. Concentration of dissolved solids (salts)
4. Turbidity (visual assessment)
5. Size of pond
6. Vegetative cover
7. List of species observed

Sedimentation will be monitored after the ponds have dried. Stakes with incremental markings along their length will be placed in the ponds. These stakes will be examined to determine the amount of silt deposition.

Trash may accumulate in the ponds. It will be removed from the ponds during the monitoring visits.

Predator Management

Monitoring all ponds for the presence of bullfrogs and non-native fish will occur at the time the ponds are surveyed for larval salamanders and turtles. No fish will be purposely introduced into the golf course lake.

Pond Dams and Spillways

The dams and spillways that regulate the water level in the ponds will be checked on a monthly basis during the regular monitoring visits. These structures will be examined for cracks, leaks, and erosion. In addition, the water level of the ponds will be recorded at this time.

Upland Habitat

Upland habitat will be monitored for vegetation change, maintenance of grassland conditions, and for rodent burrows.

A visual assessment will be made of the vegetation in the upland portions of salamander habitat to assure maintenance of grassland plant cover. Photographs of vegetation, taken once per year during the September site visit, will be used as a standard to which changes can be compared.

A survey of rodent burrows will be made in areas surrounding ponds. This information will indicate the suitability of upland areas for providing estivating habitat for California tiger salamanders. The goal of the mitigation plan is that the ground squirrel population will remain at or near present levels.

Off-Road Vehicle Activity

Off-road vehicle activity will be monitored on the project site in the course of general site visits during September through June. Every month an assessment will be made of the use of California tiger salamander habitat by off-road vehicles. If these vehicles are by-passing barriers and causing damage to habitat, then new barriers will be erected to prevent access.

RESPONSIBLE PARTY

Tom Hix
Hayes Valley Development Partners (HVDP)

MAINTENANCE

HABITAT

Removal of Sediment From Ponds

Sediment will be removed from ponds periodically depending on the rate of accumulation. Removal will occur after one foot of sediment has settled in the bottoms of the ponds. No more than 50 percent of the pond bottom will be removed in one season. Mechanical equipment will be used to remove the sediment. A maintenance corridor will be established to access the bottom of each pond at the Lion's Gate property to reduce the impact of mechanical equipment on salamander habitat. Sediment removal will be overseen by a qualified observer to search for California tiger salamanders burrowed in the sediments.

Removal of Bullfrogs from Ponds

Any bullfrogs found in CTS breeding ponds will be removed. Capture of adult bullfrogs will occur immediately upon discovery. Seining for bullfrog tadpoles will occur if they are discovered in a pond and that pond has not dried by September.

Removal of Trash From Ponds

Trash will be removed from the ponds in the fall (September) prior to the rainy season. Trash will be removed from the ponds every month that water remains (usually through May).

Maintain Pond Dams and Spillways

Failed portions of dams and spillways will be repaired by the maintenance provider. The repair work will not occur until the pond dries, unless the repair is necessary to prevent the draining of a pond.

Mosquito Control

Chemical treatment of ponds for mosquito control that uses a general insecticide/pesticide will be prohibited. A suitable alternative to chemical treatment may be the use of an available strain of *Bacillus thuringensis* specific for mosquito larvae. Mosquito fish (*Gambusia* sp.) will not be released to control mosquitos because they prey on the eggs and larvae of tiger salamanders.

Upland Habitat

Range Management

The grazing program will be designed to maintain the proper amount of thatch and grass cover in grassland habitat areas. Shrubs that are not killed by grazing will be removed by hand. The grazing program for the April through September season will be designed to result in a grass cover averaging 2-3 inches in height at the end of the grazing season in September (residual dry matter of 400 lbs/acre).

Rodent Populations

Rodent populations, primarily California ground squirrels, will be monitored to ensure that they continue to inhabit the upland salamander habitat areas. The grazing regime, as described above, will be adequate to maintain habitat for ground squirrels in grassland areas. If the ground squirrel population exhibits a declining trend, remedial actions will be taken, under guidance from the CDFG.

MAINTENANCE OF PROPERTY BOUNDARY FENCE

The property boundary fence will be repaired as needed. Repairs will consist of mending holes in the fence, broken cables, and broken fence posts. Monitoring off-road vehicle activity occurs at monthly intervals immediately before and during the time that salamanders are active. Repairs will occur immediately upon discovery of the need for repairs.

RESPONSIBLE PARTY

Tom Hix
Hayes Valley Development Partners (HVDP)

SCHEDULE

The schedule for implementation of the monitoring plan will be phased. Construction of new ponds will take place in the fall following project approval. Introduction of salamander larvae to existing ponds 4 and 5 will occur in the first breeding season after project approval. Introduction of salamander larvae to the new ponds will occur in the second and third seasons that the ponds fill with water. Maintenance and monitoring activities associated with the new ponds will begin, as scheduled, upon their construction. Elements of the plan associated with the golf course will be implemented when construction occurs.

Monitoring and maintenance activities will occur prior to and during construction where appropriate and for five years following completion of the golf course. The following table presents a list of tasks and an associated schedule for completion of the tasks (Table A).

The table is divided into three sections. The first section describes tasks associated with project construction. Examples of these types of tasks include construction of ponds, installation of fences etc. These tasks will only occur once, during project construction. The other two types of tasks are associated with monitoring and maintenance. These tasks entail monitoring salamander and turtle population levels and habitat characteristics and maintaining habitat quality. These activities would occur yearly after the completion of project construction. They would begin upon initiation of the construction of ponds.

Table A - Mitigation Plan Schedule

TASK	SCHEDULE
Pre-construction activities	
Salamander introductions into Ponds 4 and 5	Upon agency and Hayes Valley Development Partners (HVDP) approval
Pond turtle mark and release	Upon agency and HVDP approval.
Exclusion of adult salamanders from construction areas	Fall prior to initiation of grading.
Construction of Habitat Features	
Ponds/Spillways	First fall following project approval
Off-road vehicle fences	During Project Construction
Introduction of California tiger salamanders to new ponds	Winter/early spring of second and third years ponds fill following their construction.

TASK	SCHEDULE
Permit Monitoring (First 5 Years)	
Number of eggs and/or larvae of California tiger salamander	Once per month; November through May; depending on presence of water
Pond turtle surveys	Once per month; March, April, May, June, September
Pond chemistry	Once per month; November through May
Sedimentation	Once per year; June or July
Presence of bullfrogs	Once per month; November through May
Trash	Ongoing; September through May
Pond dams and spillways	Ongoing; September through June
Off-road vehicle fence	Ongoing; September through June
Long-term Monitoring (After 5 Years)	
Number of eggs and/or larvae of California tiger salamander	Twice per year; March, May; depending on annual rainfall patterns
Pond turtle surveys	Twice per year; April, July
Upland habitat	Once per year; September
Maintenance	
Sedimentation	Once per year; August, if necessary
Presence of Bullfrogs	Immediately upon discovery; November through May
Trash	Continually; September through May
Pond dams and spillways	Continually; September through June
Upland Habitat	Once per year; April through September
Off-road vehicle fence	Immediately upon discovery; September through June
Annual Report	October

ANNUAL REPORT

An annual report will be prepared and submitted to the Department of Fish and Game and the U. S. Fish and Wildlife Service in October of each year of the permit monitoring period. The report will discuss the results of the salamander and pond turtle monitoring and maintenance activities of the past year.

The annual report will discuss any new information pertaining to the biology of California tiger salamander and western pond turtle that was gathered from the population at the Lion's Gate site. Such new information could include the timing and duration of breeding, timing of transformation to the adult stage, and any information on the use of upland habitat on the property.

The condition of the breeding and upland habitat will be discussed in the annual report. Topics would include environmental conditions of the ponds (such as turbidity), relative population levels of invertebrates and other potential food sources in the ponds, and length of time that water remains in the ponds. The report will include an assessment of the success of any introduction or natural colonization of California tiger salamanders or western pond turtles into ponds on the Lion's Gate project. The report will present information on the relative numbers of salamander larvae and pond turtles that are present in each pond and compare those numbers to the number present in previous years. The condition of the upland habitat will be discussed in the annual report including the presence of an adequate rodent population and associated burrows and the presence of rock outcrops, fallen logs, and other objects that would provide cover.

The results of monitoring dams, spillways, culverts, and water control structures and the need for removal of sediment will also be discussed in the report. Additional topics for discussion in the annual report will include any off-road vehicle activity and the presence of bullfrogs or predatory fish in the breeding habitat of the California tiger salamander and western pond turtle.

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LSA Associates, Inc.

Environmental Assessments
Transportation Engineering
Resource Management
Community Planning
Environmental Restoration

LSA

December 18, 1995

Mr. Burt Verrips
Nolte and Associates, Inc.
60 South Market Street, Suite 300
San Jose, CA 95113

Subject: Lion's Gate Wetlands Mitigation

Dear Burt:

Harvey and Associates estimated that the Lion's Gate project will result in the fill of approximately 1.5 acres of area subject to the jurisdiction of the U.S. Army Corps of Engineers under Section 404 of the Clean Water Act. This appears to be a maximum amount of project fill and this figure may be reduced by refinements in the plan. The project is proposing to mitigate on-site for all project wetland fills.

Implementation of the project's California Tiger Salamander and Western Pond Turtle Mitigation plan will result in the creation of approximately 0.75 acre of wetland area. The project is proposing to create an additional 0.36 acre of wetland habitat adjacent to Hole #5 by grading down an upland area so that it floods when Pond #1 is full. This results in a total wetland creation of 1.11 acres. If project fill exceeds the amount of currently proposed mitigation, additional wetland area will be created on the project site. Sufficient area is available to expand wetland habitat at Pond #1. An additional California tiger salamander breeding pond could be created which would qualify as a wetland and would benefit that species. The creation of either or a combination of the two would achieve the necessary level of wetland mitigation on the project site.

12/18/95(H:\MALCOLM\LETTERS\VERRIPS.LTR)

157 Park Place
Pt. Richmond, California 94801

Telephone 510 236-6810
Facsimile 510 236-3480

Please give me a call if you have any questions about the information in this letter.

Sincerely,

LSA ASSOCIATES, INC.

Malcolm J. Sproul

Malcolm J. Sproul
Principal

MJS/ka

CONCEPTUAL CREEK REVEGETATION/ENHANCEMENT PLAN
LION'S GATE DEVELOPMENT PROJECT, SANTA CLARA COUNTY

March 4, 1996

Prepared for:

Hayes Valley Development Partners
405 El Camino Real #27
Menlo Park, CA 94025

Prepared by:

LSA Associates, Inc.
157 Park Place
Pt. Richmond, California 94801
(510) 236-6810
LSA Project #HVD501

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INTRODUCTION/SUMMARY

The Lion's Gate site is located south of the City of Morgan Hill in southern Santa Clara County. Lion's Gate is a proposed residential development and golf course project. The upstream reaches of the West Branch of Llagas Creek are present on the site.

This conceptual creek revegetation plan proposes to establish approximately two and one-half acres of riparian vegetation along a portion of the West Branch of Llagas Creek which flows through the location of the proposed the golf course. This reach, which is approximately 6,500 feet (1.2 miles) long, begins at an existing stock pond and extends downstream to the eastern boundary of the course.

Revegetation/enhancement activities will include removal of exotic species, erosion control, creek bank stabilization, planting of native riparian trees genetically appropriate for the site and installation of a temporary irrigation system and browse protection. The plantings will be maintained for a minimum of five years to assure the successful establishment of the riparian habitat.

REVEGETATION/ENHANCEMENT OBJECTIVES

The objective of this conceptual revegetation/enhancement plan is to establish a corridor of native riparian trees and shrubs along a portion of the West Branch of Llagas Creek on the Lion's Gate property to increase the wildlife habitat value of the creek zone.

SETTING

The 1,656-acre Lion's Gate property is located in the hills south of the City of Morgan Hill on the western side of the Santa Clara Valley (Figure 1). Hayes Valley, trending in a northwest to southeast direction, forms the central portion of the property. The northern side of the valley is bordered by low hills separating it from Santa Clara Valley and Morgan Hill. The property extends to the base of this ridge on its eastern border and ends at Coolidge and Turlock Avenues. The southern side of the valley is bordered by the ridgeline which includes Lion's Peak. The property extends on the west to the vicinity of Watsonville Road (Figures 1 and 2).

The property contains the headwaters of the West Branch of Llagas Creek. The West Branch of Llagas Creek flows eastward through the site and continues off the property where it joins Llagas Creek east of the City of Gilroy. Approximately 8,000 feet (1.5 miles) of this creek is present on the property.

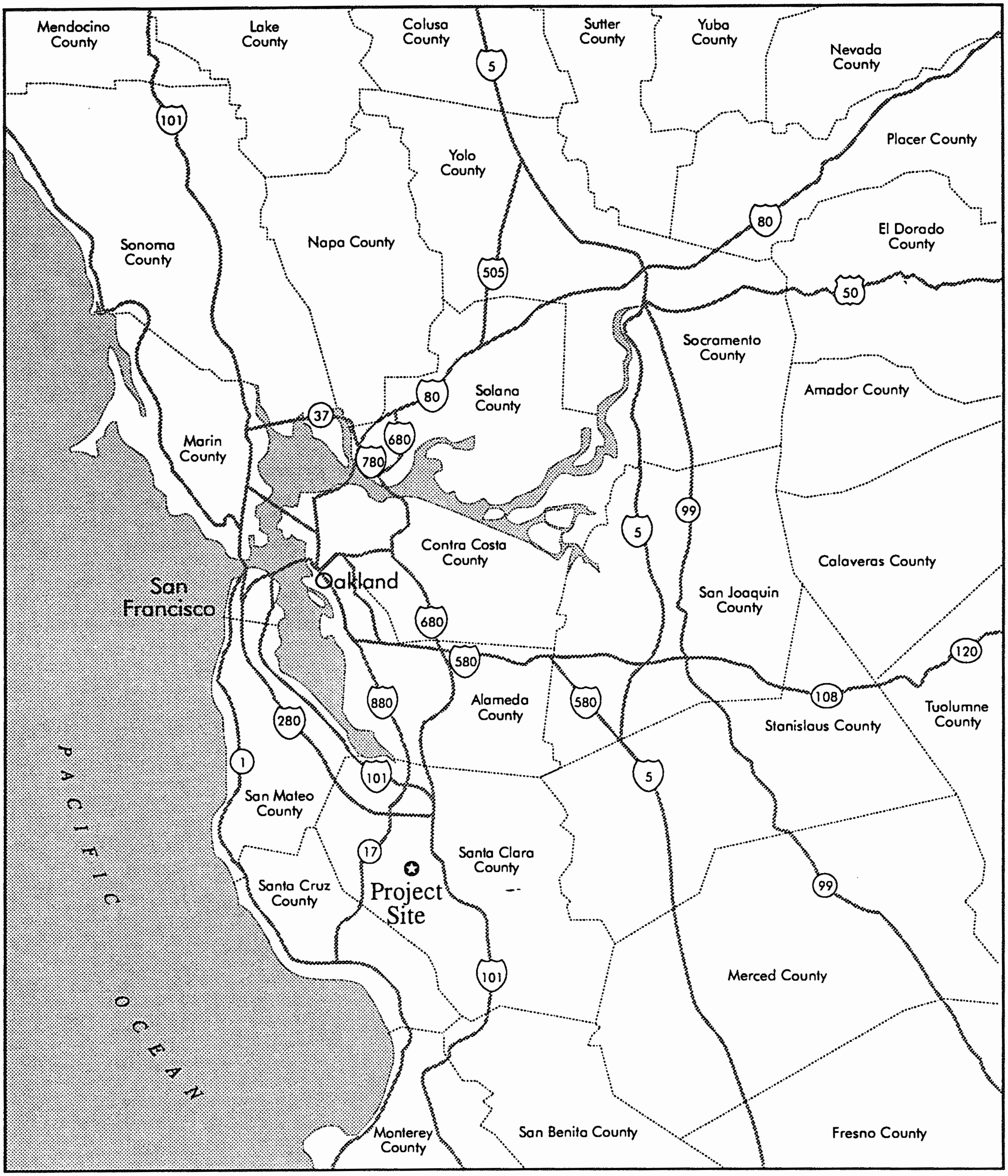

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Figure 1

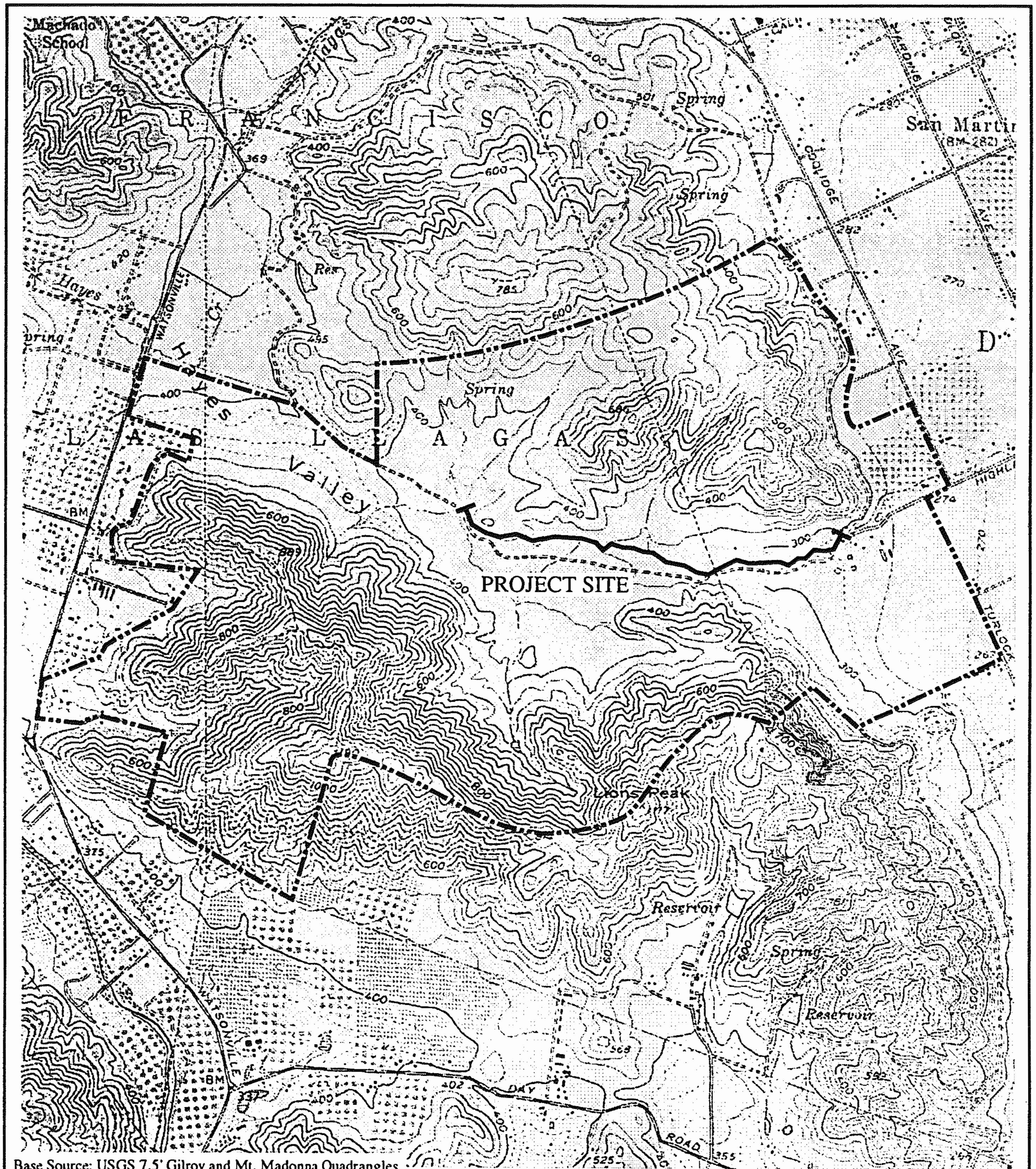
N

LSA

Scale in miles

0 20

Regional Location



Base Source: USGS 7.5' Gilroy and Mt. Madonna Quadrangles

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Figure 2

Site Boundary

Reach of West Branch of Llagas Creek to be Planted

N

LSA

Scale in feet

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Site Location

The majority of the site is undeveloped and used as rangeland for cattle. A network of dirt roads and barbed-wire fences as well as seven constructed stockponds are present on the site. Several residences and associated out buildings are located at the eastern edge of the property off of Highland Avenue.

Vegetation

Grassland and oak savanna/woodland form the primary plant cover within the project area. The dominant grass species in both vegetation types are soft chess (*Bromus hordeaceus*) and wild oats (*Avena* spp.). In the lower portions of the valley, and adjacent to most of the waterways, the dominant grass is Italian wildrye (*Lolium multiflorum*) interspersed with sizable patches of Mediterranean barley (*Hordeum marinum* ssp. *gussoneanum*). Valley oak (*Quercus lobata*) is the most commonly occurring tree within the oak woodland/savanna.

Existing woody vegetation within the West Branch Llagas Creek riparian corridor consists of single individuals or small stands of mature trees of western sycamore (*Platanus racemosa*), valley oak, and black walnut (*Juglans hindsii*). There are no seedlings or saplings of the dominant trees, nor is there a shrub understory along the creek except for a few stands of willow (*Salix* sp.) at the western end. The plant cover along the majority of the creek corridor is dominated by Italian wildrye and other herbaceous vegetation found in the non-native grassland. Water cress (*Rorippa nasturtium-aquaticum*), curly dock (*Rumex crispus*), and soft rush (*Juncus effusus*) grow within the creek channel.

Soils

The USDA Soil Conservation Series (SCS) mapped nine soil series in the area of the Lion's Gate property (Cropley clay, Garretson gravelly loam, Gilroy clay loam, Hillgate silt loam, Keefers clay loam, Los Robles clay loam, Maxwell clay, Montara rocky clay loam, Vallecitos rocky loam). Only Los Robles clay loam is of concern for the revegetation/enhancement effort. Los Robles clay loam occurs in the valley bottom adjacent to the West Branch of Llagas Creek and also extends up the larger tributaries. It is a valley bottom soil occurring on alluvial fans and underlain by stratified alluvium derived from basic igneous rock. It is approximately 58 inches deep, is well drained, and has moderately slow permeability.

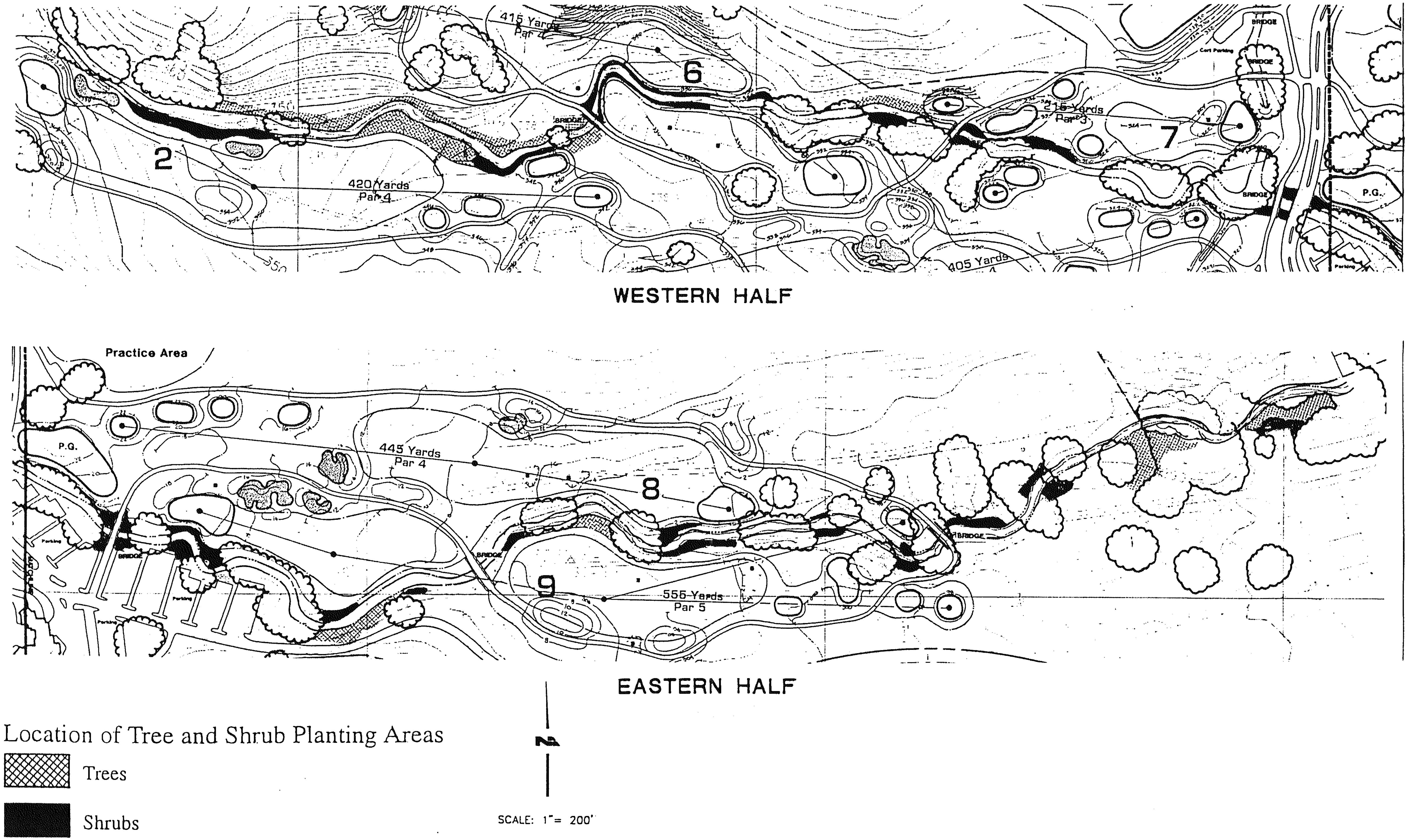
Hydrology

The property forms the headwaters of the West Branch of Llagas Creek. The creek has eight primary tributaries on the property which flow for varying periods during winter and spring months and are dry the remainder of the year. Several of the drainages have been dammed to create stockponds. The western portions of the property flow into Uvas Creek. The northeastern corner of the property flows directly into Llagas Creek. Seeps, where groundwater intersects the ground surface resulting in areas of saturated soil, are scattered over the property and are particularly common near, or directly adjacent to stream courses.

REVEGETATION/ENHANCEMENT PLAN

This conceptual plan proposes to plant native trees and shrubs along the West Branch of Llagas Creek, from the existing stock pond in the northwestern portion of the golf course to its eastern boundary (Figure 3). This reach is approximately 1.2 miles long. The channel ranges in width from 2 feet near the pond to approximately 9 feet at its eastern end. The width of the riparian corridor and the height of the vegetation take into consideration the design and the playability of the golf course. Six bridges will be constructed across the creek channel.

Revegetation/enhancement activities will include removal of exotic species, placement of erosion control netting or other slope stabilization (if necessary), erosion control hydroseeding, and installation of a temporary irrigation system and browse protection.



RIPARIAN HABITAT RESTORATION AND ENHANCEMENT CONCEPT

Source: LSA Associates

FIGURE 3

IMPLEMENTATION PLAN

TREE PROTECTION

The West Branch Llagas Creek corridor contains several mature specimens of native tree. Existing trees will be protected during construction and incorporated into the enhancement plan. Specific measures to protect these trees include:

- No grading or excavation will occur within the driplines of any native tree. Orange plastic construction fencing will be placed around the driplines of all trees to be preserved. Tree protection fencing will be placed prior to construction and removed when construction is complete.

- Existing native, woody riparian plant seedlings (if any) within the creek banks will be protected during construction and irrigated as necessary so that they may become established as viable members of the enhanced creek habitat.

- Woody exotics growing within the creek banks will be removed manually.

- A qualified restoration specialist will be retained to perform any necessary pruning of trees.

Silt fences, straw bales, and/or other erosion control measures will be used to assure that the creek is not impacted by construction activities.

PLANTING/SEEDING

Planting Concept

Tree species to be planted within the creek zone include western sycamore and valley oak. Western sycamore, a riparian tree requiring a year-round supply of water, will be planted near the creek channel along the lower banks. Valley oak will be planted on the upper portions of the creek bank and the adjacent valley bottom areas.

Shrub plantings will be made following the same concept as the tree plantings. The lower portion of the creek banks, closest to the channel will be planted with riparian shrubs dependent on greater water availability. Plantings within this zone will include California blackberry (*Rubus ursinus*), California rose (*Rosa californica*), and mulefat (*Baccharis salicifolia*). The upper portions of the creek bank will be planted with coffee-berry (*Rhamnus californica*) and snowberry (*Symphoricarpos albus* ssp. *laevigatus*).

Trees will be planted in clusters of 3-7 trees with an average spacing of 25 feet between trees within the clusters, and 50 to 70 feet between groups of trees. Shrubs will be planted in clusters of 5-9 plants with an average spacing of 5 feet between shrubs within the clusters and 10-15 feet between the clusters. Figures 4 and 5 show a creek cross-section and a conceptual plan view of tree and shrub placements, respectively.

The species chosen for planting within these zones represent plants typically found in a riparian environment in this area of Santa Clara County. Plant materials will consist of container-grown plants from locally collected material. Table A lists the proposed plant species and includes general spacing guidelines, and sizes of plants to be installed.

Seeding and Planting Materials/Methods

Erosion Control Seeding

All areas disturbed by grading within the riparian corridor will be seeded with a mix of grasses and forbs to prevent soil erosion and provide habitat enhancement.

Erosion-control seeding activities will take place in the fall so that sown seeds can benefit from winter rains. The seed mix will be composed of the native grasses and forbs listed in Table B.

Planting

The riparian corridor will be planted with container-grown plant stock; sizes will range from deep pots (2" x 9" black plastic tubes) and 1-gallon containers to larger pots such as citrus pots (4 gallons) and tree pots (15 gallons). The plants will be propagated from locally collected material and contracted to be grown as nursery stock. The contract will be set up 12 to 16 months prior to plant installation.

Valley oak and sycamore trees to be planted will be grown in 4-gallon citrus pots or 15-gallon containers; shrubs will be grown in deep pots or 1-gallon containers.

In planting areas where the soil has been compacted by grading, planting holes will be augered prior to employing the planting methods outlined below. Figure 6 shows a tree and shrub planting detail.

- Planting holes will be 1.5 times larger than the rootball. The sides of the holes will be scarified, watered, and allowed to drain before the plants are placed in the holes. Slow-release fertilizer tablets, such as Agriform 9 gram tree and shrub fertilizer (or equivalent), will be added to each planting hole, 2 inches below the soil surface. The

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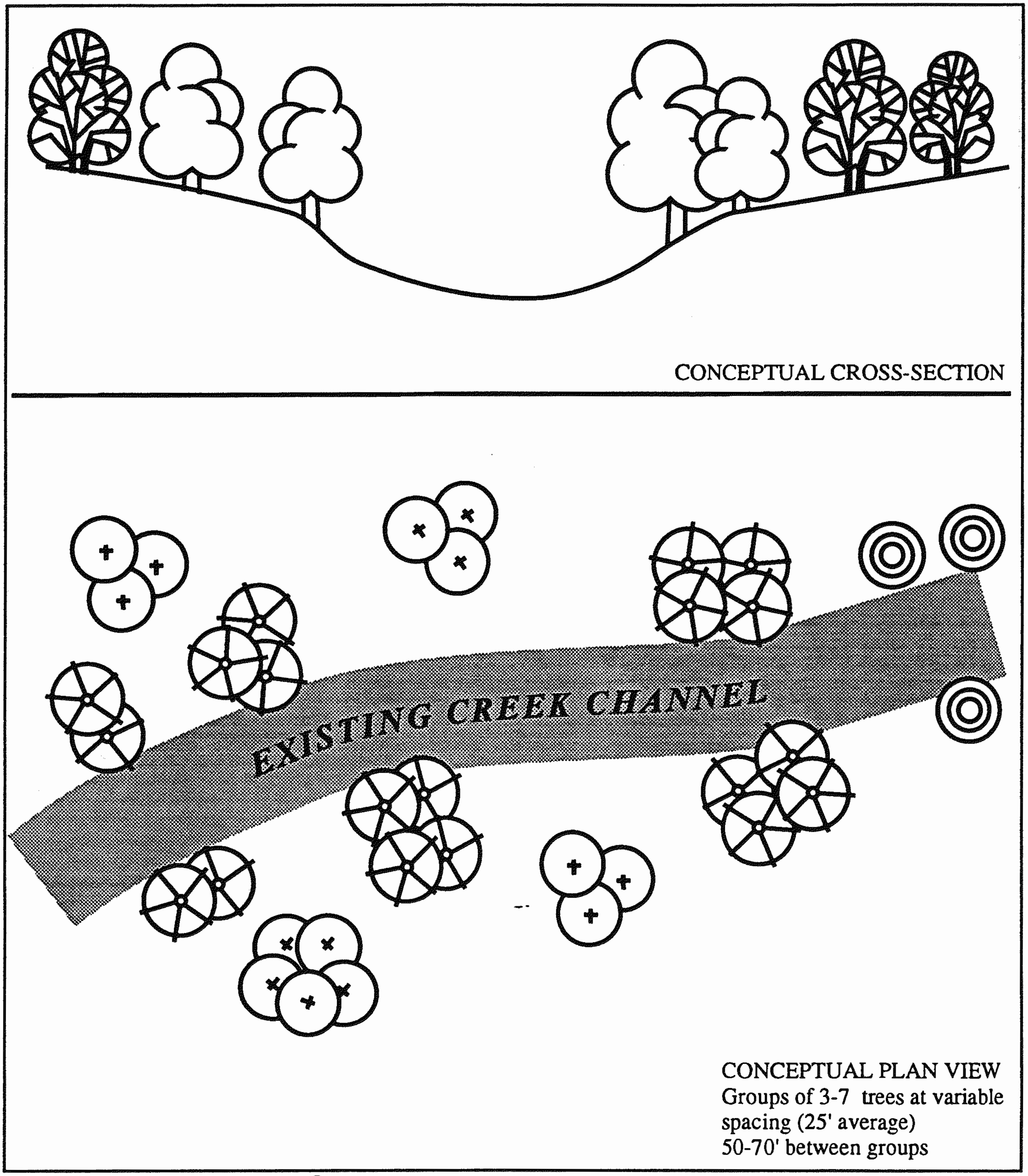

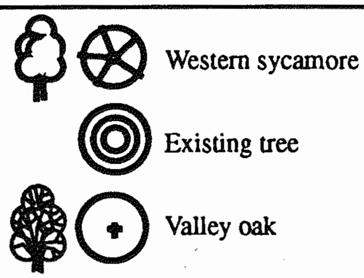

Figure 4

Riparian Corridor Tree Placement

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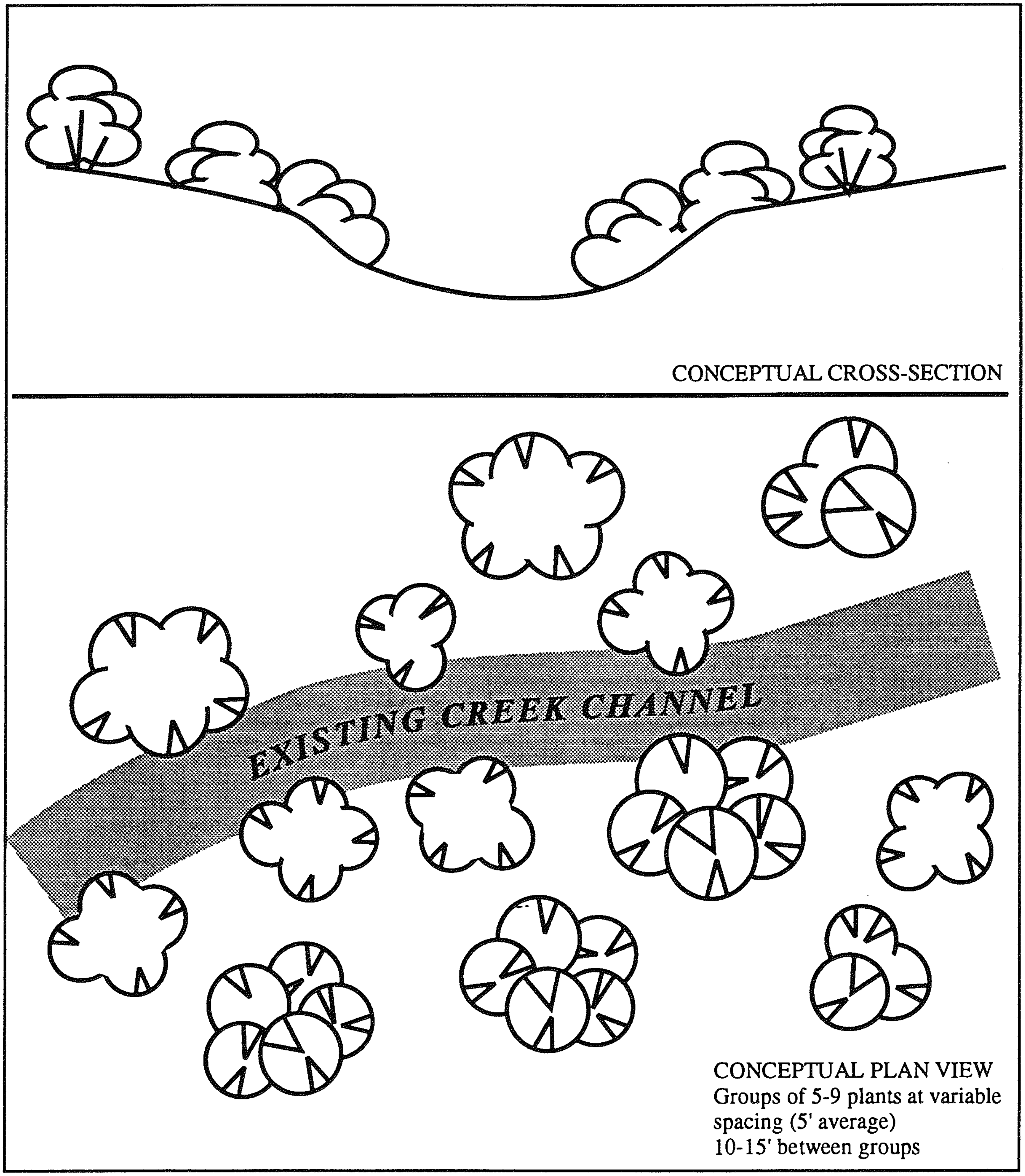

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Figure 5

Coffeeberry
California rose
California blackberry
Mulefat
Snowberry

LSA

Riparian Corridor Shrub Placement

Table A - Plant Materials

Common Name	Scientific Name	Spacing	Plant Size
California blackberry	*Rubus ursinus*	5 feet	deep pot or 1-gallon container
California coffee-berry	*Rhamnus californica*	5 feet	deep pot or 1-gallon container
California rose	*Rosa californica*	5 feet	deep pot or 1-gallon container
Mulefat	*Baccharis salicifolia*	5 feet	deep pot or 1-gallon container
Snowberry	*Symphoricarpos albus* ssp. *laevigatus*	5 feet	deep pot or 1-gallon container
Sycamore	*Platanus racemosa*	25 feet	citrus pot or 15-gallon container
Valley oak	*Quercus lobata*	25 feet	citrus pot or 15-gallon container

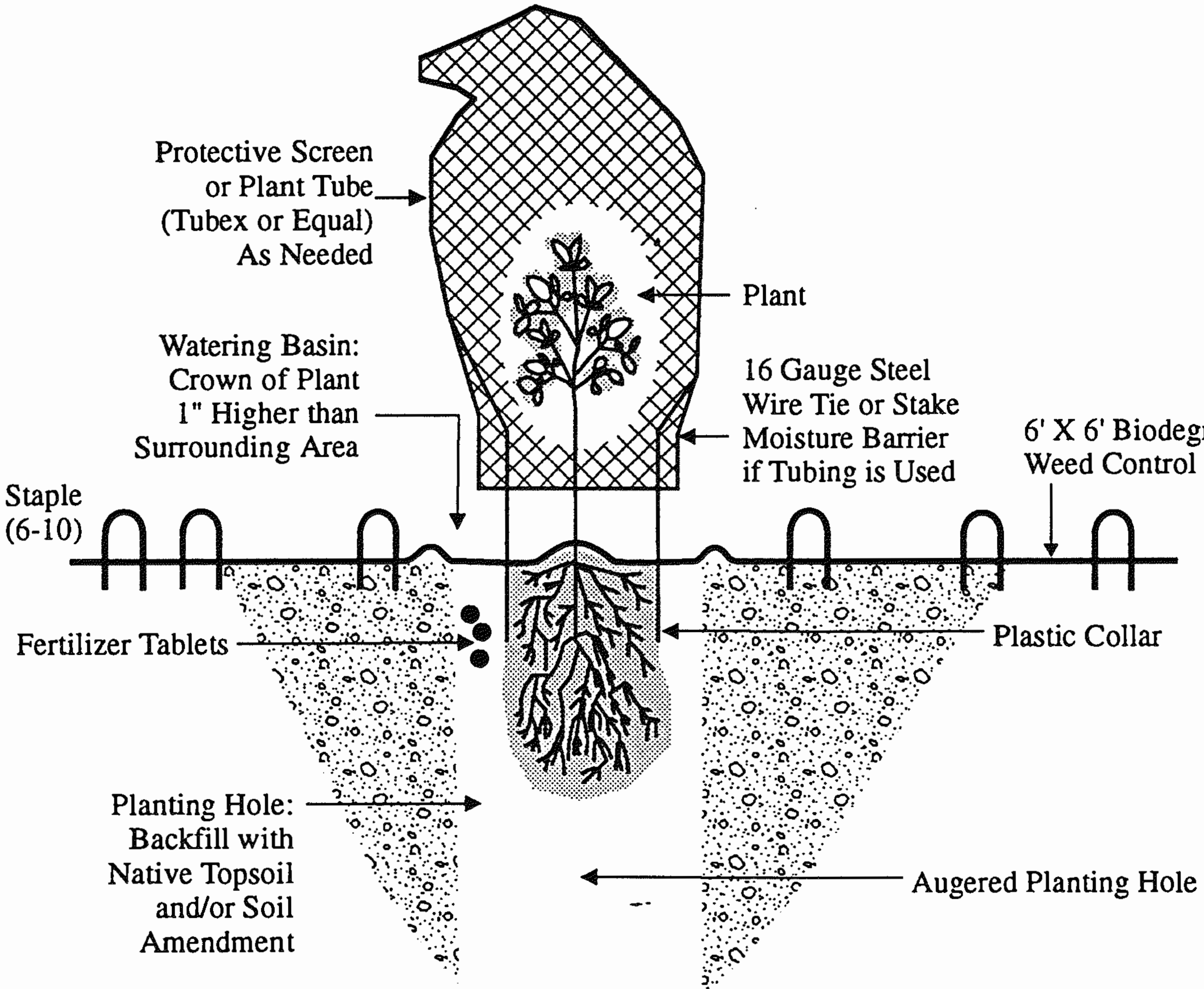
Table B - Erosion Control Hydroseed Mix

Seed Species	Function/Type	Lbs. per acre
California brome (*Bromus carinatus*) native variety	perennial	15 lbs. PLS*
California poppy (*Eschscholzia californica*)	annual	1 lb. PLS
Giant wildrye (*Elymus glaucus*)	perennial	2 lbs. PLS
Lupine** (*Lupinus succulentus*)	nitrogen fixing	3 lbs. PLS
Meadow barley (*Hordeum brachyantherum*)	perennial	25 lbs. PLS
Purple needlegrass (*Stipa pulchra*)	perennial	2 lbs. PLS
Mulch	erosion control	2000 lbs.
Fertilizer	plant establishment	200 lbs.
Tackifier***	erosion control	100 lbs.

* PLS = Pure Live Seed

** Seed will be treated with nitrogen-fixing bacteria inoculant by the seed supplier on the seed supplier's recommendation.

*** The tackifier rate is approximate, and should be applied at the rate and in the manner specified by the manufacturer.



Planting Notes:
1. Planting holes to be dug one and one half times larger than rootball.
2. Provide four inch downslope berm to retain water on slopes.

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Figure 6

LSA

Tree and Shrub Planting Detail

holes will then be backfilled with suitable soil from the site, ensuring that the plants' feeder roots are below the soil surface and the plants will be watered. Shallow watering basins will be constructed around the plants to direct runoff and irrigation water to the root zone.

- Moisture barriers will be installed at the base of each tree. The moisture barrier will consist of a four-foot by four-foot plastic fabric which will also serve to control weeds around the trees. Three-foot diameter watering basins will be constructed to assist in moisture retention as described above. Browse protection cages will be installed on new tree and shrub plantings in the creek corridor if monitoring indicates evidence of browsing (see Figure 6).

- In cases of excessive soil cracking due to shrink/swell soil conditions, 50 percent nitrolized woodchips will be added to the backfill.

- All plantings will be spaced at variable distances, with a mix of species to create a natural appearance and to simulate existing conditions. As previously stated, plants will be grouped in clusters with three to nine plants of one species in each cluster.

- Planting will take place in the late fall or early winter after soil and air temperatures have cooled, and winter rains have begun.

Irrigation

All plants will be irrigated directly after planting. Shrub and tree plantings will be equipped with a temporary drip irrigation system. Two drip emitters will be installed on the upslope behind each plant to ensure thorough and even irrigation. Two-gallon per hour emitters will be used for trees and one-gallon per hour emitters will be used for shrubs.

Irrigation will be applied during dry winters to supplement any deficiency in rainfall that may occur during the first two years. Irrigation will also be applied during the first two summers after planting to ensure the successful establishment of the plants. The need for supplemental irrigation during subsequent years will be determined by the project restoration specialist.

The amount and frequency of irrigation will be determined after a test irrigation application. The test irrigation will entail monitoring the percolation rate and level of saturation of the soil. After the soil has reached its saturation point, the soil around the root zone will be augered to determine if the water has percolated below the root zone. If not, the process will be repeated until the desired results are achieved. The time required to achieve the goal will determine the application rate.

IMPLEMENTATION SCHEDULE

The schedule for the implementation of the Revegetation Plan is outlined in Table C.

Table C - Implementation Schedule

Activity	Time of Year
Site Preparation, Grading	Late spring and summer
Erosion Control	Early fall, prior to planting
Irrigation Installation	Fall, prior to and concurrent with planting
Plant Installation	Late fall to early winter

MAINTENANCE AND MONITORING

A specialist with expertise in the restoration of riparian habitat will be retained to serve as project monitor. The restoration specialist will oversee the hydroseeding activities, plant and irrigation system installation and maintenance, and will prepare annual reports. The plantings will be monitored for compliance with the performance standards contained in this revegetation/enhancement plan.

An as-built project inventory and initial report will be prepared and submitted within six weeks of each phase of plant installation, notifying all responsible parties of completion. This will begin the effective date of the five-year monitoring and assessment period for each phase.

MAINTENANCE ACTIVITIES

Invasive, non-native species competing with the newly planted trees and shrubs will be removed upon detection. Weed control will occur for a minimum of two years. Methods for removal and control will include mowing, hand-clearing, and use of EPA-labelled herbicides suitable for aquatic settings, thus avoiding harm to or loss of native vegetation and wildlife.

The planting area will be maintained for a minimum of five years following planting. Tree and shrub mortality exceeding the target values will be compensated for by planting additional trees. Replacement plantings will take place in the fall or winter only. Any broken or malfunctioning parts of the irrigation system during this time will be repaired immediately upon detection. Trash removal will take place year-round. Vandalism repair will occur as needed.

If certain plant species are more successful in establishing they will be used to replace the less successful species.

Weed cloth will remain on the project site because, over time, vegetation will establish itself on the cloth.

The planting areas will be maintained in a stable condition during the monitoring period. Erosion gullies, greater than 12 inches in depth, and bank undercutting will be corrected immediately.

MAINTENANCE SCHEDULE

Maintenance tasks will be performed according to the schedule provided in Table D.

Table D - Maintenance Schedule

Activity	Time of Year	Year
Check and repair irrigation system, erosion and browse damage; check plant mortality; check for vandalism; weed around individual plants; remove large weeds and trash	30, 60, and 90 days following initial plant installation, then every 3 months	Year 1
Check and repair irrigation system, erosion and browse damage; check plant mortality; check for vandalism; weed around individual plants; remove large weeds and trash	March - September, 1/per month; two visits/year	Year 2- 5
Replace dead plants	Fall or winter	

MONITORING METHODS

Non-Sampling Assessment

Monitoring after planting will consist of a visual assessment of the entire revegetation/enhancement area. The assessment will be subjective and will include an evaluation of overall cover, general health, hydrologic damage, vandalism, and predation.

Wildlife and plant species observed will be recorded during each field visit.

The sites will be monitored for a period of five years.

Assessment by Sampling

Sample plots will be set up and permanently staked within the riparian corridor. All trees and shrubs planted within these plots will be numbered and their locations mapped. The height of all new trees will be measured and their general health described. Photographs of each plot will be taken two times a year. If mortality exceeds 15 percent in a plot, the immediate area of the plot will be completely inventoried to determine overall mortality. The number of dead trees exceeding 15 percent of the original number of trees planted, will be replaced during the next appropriate planting season.

The plots will be monitored for a period of five years.

Monitoring Schedule

Monitoring will begin 30 days following the initial plant installation. Subsequent monitoring visits will take place 60 and 90 days following plant installation and, quarterly for the first three years. Monitoring visits will take place bi-annually during the fourth and fifth years of the maintenance period, if major corrective measures have not been implemented.

Photos

Photo points will be permanently marked at each sample plot as well as at a few overall viewing sites. The overall viewing will show the north, west, east, and south aspects of the sites.

PERFORMANCE CRITERIA

The planting will be determined successful if, after five years, 2.5 acres of riparian habitat has been established, the plantings are healthy and likely to survive without further maintenance.

The following standards for riparian tree and shrub establishment outlined for year five must be achieved:

- At least 85 per cent of all planted trees and shrubs must be alive and provide a cover of at least 50 per cent.

- All invasive species must be eradicated by the end of the fifth year.

REPORTS

AS-BUILTS

The applicant will prepare a report within 6 weeks of completion of site preparation and planting, describing the as-built status of the mitigation project. Any deviations from the original plan will be described. The report will include a topographic map showing the as-built contours and the location of structures, irrigation lines, and plantings. The names and phone numbers of all contractors and subcontractors who worked on the project will be included in the report.

ANNUAL REPORTS

Following the initial as-built report, annual reports will be submitted to the appropriate agencies until the end of the monitoring period.

In addition to evaluating the progress relative to the performance standards, the reports will include photographs taken from permanent photo points. Monitoring during the first year will provide early data indicating the likelihood of success of the mitigation program. The reports will discuss briefly the findings of the monitoring visits and, at a minimum, would include a discussion of the condition of the irrigation system, mortality, the necessity for replacement of failed plantings, and the ability of the mitigation to meet performance standards.

The reports will include lists of animals and animal signs observed in the project area (based on incidental observation, not a comprehensive survey).

Additional reports will be produced if a need for substantial corrective action is identified. These reports will identify the performance problem and will include a schedule for taking corrective action. These reports will be prepared within 90 days of the date that a need for corrective action is recognized.

The first annual report will be prepared one year after the preparation of the as-built report. Subsequent annual reports will be submitted on the anniversary of the first annual report submittal. Annual reports will be submitted to appropriate agencies.

Annual reports will be provided for five years after the last as-built report, or longer if any major corrective measures are necessary.

CONTRIBUTORS TO THE REPORT

Malcolm Sproul, Principal in Charge
Linda Aberbom, Project Manager/Restoration Specialist
Eva Buxton, Botanist

Status of lepidoptera of conservation concern at the proposed Lions Gate development site (Hayes Valley, San Martin, Santa Clara County)

31 July 1992

Alan E. Launer, Ph.D.
Center for Conservation Biology
Department of Biological Sciences
Stanford University

Report on the status of the Bay checkerspot butterfly, Opler's longhorn moth, and the unsilvered silverspot butterfly at the proposed Lions Gate development site (Hayes Valley, San Martin, Santa Clara County)

Introduction

The hills southwest of San Martin, Santa Clara County, California include a significant outcrop of serpentinitic rock. Soils derived from serpentinite support a distinctive flora of native grassland species. Among these species are the larval hostplants and adult nectar sources of the Bay checkerspot butterfly, *Euphydryas editha bayensis*, a subspecies listed as threatened by the U.S. Fish and Wildlife Service (USFWS), and Opler's longhorn moth (*Adela oplerella*), a species under consideration for protection by the USFWS (Category 2R). These hills also support an oak woodland savanna with extensive areas of grassland composed primarily of non-native annual grasses. In habitats such as these, plants of the genus *Viola* (violets) are occasionally found in large numbers. These plants are the larval hostplants of butterflies of the genus *Speyeria*, including the unsilvered silverspot butterfly (also known as the coast silverspot butterfly), *S. adiaste adiaste*, a subspecies under consideration for protection by the USFWS (Category 2).

Habitat requirements and biology of the Bay checkerspot butterfly and Opler's longhorn moth.

The Bay checkerspot butterfly and Opler's longhorn moth are restricted to patches of native California grassland in the San Francisco Bay Area[1] These grasslands contain a mixture of native forbs including the larval hostplants of both the Bay checkerspot butterfly (*Plantago erecta*, the primary hostplant, and *Orthocarpus densiflorus* or *O. purpurascens* , secondary larval hosts) and Opler's longhorn moth (*Platystemon californicus*, the only known larval hostplant). These grasslands are typically rich in nectar resources, including *Achillea millifolium, Lasthenia chrysostoma, Layia platyglossa, Allium* species, *Muilla maritima, Amsinkia intermedia, and Lomatium* species. The only areas that support this mixture of grassland forbs are on patchily distributed areas of serpentine-derived soils. As a result, populations of the Bay checkerspot butterfly and Opler's longhorn moth are currently restricted to remnant patches of native grasslands that are limited in area and isolated from one another.

Variations in the timing of the adult flight period and hostplant senescence makes the Bay checkerspot butterfly highly prone to weather-induced population fluctuations. Following years favorable to the Bay checkerspot butterfly, years that favor post-diapause larval growth and

[1] Opler's longhorn moth is known to occur in an unusual grassland off of serpentine-based soils in one location in the Santa Cruz Mountains (where soils derived from marine sand deposits mimic serpentine derived soils).

prediapause larval survival, the number of butterflies may dramatically increase; some populations have been observed to exhibit a five hundred percent increase in population size from one year to the next. Similarly, following years with little spring rain, which results in the larval hostplants senescing early, the number of butterflies may decrease by an order of magnitude. Not surprisingly, Bay checkerspot butterfly populations crashed in numbers during the severe 1975-1977 drought, and a number of populations are thought to have gone extinct during this period. The population dynamics of Opler's longhorn moth are not nearly as well known. It is very likely, however, that local populations also fluctuate dramatically in number of individuals in response to weather patterns (two closely related species, *A. trigrapha* and *A. flammeusella*, have been observed to undergo large changes in population levels).

The topographic configuration of specific patches of serpentine soil-based grasslands plays a critical role in determining the ability of that habitat patch to support Bay checkerspot butterfly populations through extreme weather years. Variations in aspect and tilt angles across slopes create distinct solar exposure regimes, which in turn create distinct microclimates. Habitat heterogeneity, in terms of number of microclimates, appears to act as a "buffer" for the butterfly during periods of unfavorable weather. Steep north-facing slopes appear to form the core habitat for the Bay checkerspot butterfly, because those slopes provide the hostplants that remain edible latest in the spring. Even small areas of cool north-facing slopes will confer to a population resistance to extinctions during short or mild periods of drought. However, warmer slopes are also important. Post-diapause larvae can disperse to relatively warmer slopes, hence a lack of adjacent warm slopes may act to retard post-diapause development. Retarded development results in later flight periods, and lead to timing problems between adult flight period and hostplant senescence. A wide variety of microclimates across a patch of habitat assures that at least some survival, timely development, and reproduction can occur under most climatic conditions. Even the warmest slopes, however, can benefit the Bay checkerspot butterfly, either by providing early season nectar, which can serve to increase female fecundity, or by providing dispersal routes.

Topographic diversity probably does not influence Opler's longhorn moth in the same way as it does the Bay checkerspot butterfly. Populations of Opler's longhorn moth have been observed to persist in small, topographically homogeneous habitat patches, and are found widely scattered across the microclimatic gradient in large habitat patches.

The adult flight periods of the Bay checkerspot butterfly and Opler's longhorn moth are generally similar, with the only difference being that the moth has a slightly longer flight period than the butterfly. The timing of the flight periods are dependent on weather, but March and April are the typical months when adults of both species may be observed.

Habitat requirements and biology of the unsilvered silverspot butterfly

The habitat requirements of the unsilvered silverspot butterfly are poorly known. Like other members of the genus *Speyeria* this species undoubtedly feeds on plants of the genus *Viola*. This butterfly is usually thought of as being associated with the forest-meadow areas of the Santa Cruz Mountains. There, the butterfly probably feeds on violets found in open spaces, or in seeps. Along the eastern edge of the Santa Cruz Mountains, the unsilvered silverspot butterfly has been reported from near Lexington Reservoir, and along the Santa Clara/Santa Cruz County line. There is one report of this species from the vicinity of a seep in San Bruno Canyon (on the west side of the Coyote Valley, some 5 miles north of Morgan Hill). Unfortunately, this population is presumed to have been extirpated by the construction of a shooting range, and no specimens from this site are known to exist. Adults of this species generally begin flying in early June, and are thought to continue through July and early August.

Results and conclusions

The serpentine soil-based grasslands and nearby areas of non-serpentine woodlands adjacent to the proposed Lions Gate development site were surveyed 12 times, starting in the spring of 1985. These site visits were conducted by biologists experienced with lepidoptera and occurred on days of appropriately good weather. Most of the site visits occurred during the probable adult flight period of the Bay checkerspot butterfly and Opler's longhorn moth (as determined by their phenology at other south Santa Clara County sites). Four visits occurred during the presumed flight period of the unsilvered silverspot butterfly.

No Bay checkerspot butterflies were observed during any of the site visits. Given the extent of this survey effort, it is unlikely that a small population of this butterfly existed at the site during the study period. The serpentine soil-based grasslands adjacent to the proposed Lions Gate development were found to support large patches of the butterfly's larval host plants, *Plantago erecta* and *Orthocarpus* species. A number of plant species potentially providing nectar resources were also found at the site, including species of *Linanthus*, *Lomatium*, *Muilla* and *Lasthenia*. However, the predominately south- and west-facing slope exposures of the site, coupled with the comparatively low elevation, probably make the site generally too warm to sustain a Bay checkerspot butterfly population over the long-term. The serpentine soil-based grasslands present at the site, while quite microclimatically warm, are probably of sufficient quality and extent to support a small Bay checkerspot butterfly population during brief periods of favorable weather.

In some situations serpentine soil-based grasslands on comparatively warm slope exposures may aid in the local persistence of the Bay checkerspot butterfly, as discussed above, potentially providing early season adult nectar resources or routes for dispersal between areas of more suitable habitat. The relative isolation of the

Lions Gate site, approximately 10 kilometers south of the nearest known Bay checkerspot butterfly population (in the hills west of the intersection of Hale Avenue and Tilton), militates against the site being an effective stepping-stone dispersal route used by the Bay checkerspot butterfly. Additionally, the comparatively early plant-growth season at the site probably acts to temporally isolate the site from the Bay checkerspot butterfly population to the north; any butterflies originating from the populations to the north would probably reach the Lions Gate site only after most of the larval host plants at the site could no longer sustain prediapause larvae.

Opler's longhorn moths were present on the serpentine soil-based grasslands adjacent to the proposed development site. They were quite common throughout the serpentine grassland, and were first recorded at he site in 1986. Three other species of *Adela* were also noted from the site, *Adela punctiferella*, *A. trigrapha*, and *A. flammeusella*. Interestingly a very similar species which generally co-occurs with *A. oplerella* in the Coyote Valley area, *Adela thorpella,* was not recorded from the site. *Adela oplerella* is a small insect, no more than one centimeter in wing-length, and is not known to readily disperse from serpentine soil-based grasslands. As the proposed development at the site (as indicated by maps provided by Bert Verrips of Nolte and Associates) is well away from the serpentine soil-based grasslands, the proposed development should not impact Opler's longhorn moth.

No unsilvered silverspot butterflies were observed at the proposed Lions Gate development site. If not for the record of this species at San Bruno Canyon, some 15 kilometers to the north, the habitat present at this site would have been considered inappropriate for this species. While the habitat requirements of this butterfly are not well known, the oak woodland savannas and grasslands at the site are very low in elevation and dry compared to the known localities of unsilvered silverspot butterfly populations. While there are large number of creeks and seeps on the property which could conceivably support this butterfly, it is unlikely that a population of the unsilvered silverspot butterfly exists at the proposed development site. However, most of the late season surveys for this species occurred in 1992. For some unknown reason, 1992 was apparently not a good year for *Speyeria* butterflies in the vicinity of the Coyote Valley (a species closely related to *S. adiaste adiaste, S. callippe comstocki*, was noticeably absent from areas where it had been abundant in previous years) and the conclusion that unsilvered silverspot butterflies do not occur at the proposed development site is not as well substantiated as are the conclusions of the status of the Bay checkerspot butterfly (absent) and of Opler's longhorn moth (present).

SUMMARY

It is unlikely that the serpentine soil-based grasslands adjacent to the proposed Lions Gate development site have supported a population of the Bay checkerspot butterfly at any time during the last five years. These grasslands are probably too warm and too isolated to be considered a necessary component of the south Santa Clara County metapopulation of this butterfly, and the site could most likely only support the butterfly during brief periods of unusually favorable weather. In any event, questions regarding the status of the Bay checkerspot butterfly at the proposed development site are somewhat moot because, as presently specified, the proposed development would be well away from the serpentine soil-based grasslands. Since the proposed development, as presently configured, avoids the serpentine soil-based grasslands, any impacts to the butterfly by the proposed development, even if the butterfly did exist at the site, would be negligible.

A robust population of Opler's longhorn moth does exist on the serpentine soil-based grasslands adjacent to the proposed development site. However, as the proposed development avoids the serpentine soil-based grasslands, the development would, in all likelihood, not have any measurable impact on the moth.

At the present time, the status of the unsilvered silverspot butterfly at the proposed Lions Gate development site is unclear. This species was not encountered by our study and it is doubtful that a population of the butterfly exists in the oak woodland savannas of the site. However, most of the late-season site visits occurred during a year, 1992, when local populations of a closely related species of silverspot butterfly proved difficult to survey and the conclusion that the unsilvered silverspot butterfly is not present at the site should be considered preliminary.

Status of lepidoptera of conservation concern at the proposed Lions Gate development site (Hayes Valley, San Martin, Santa Clara County)

13 December 1993

Alan E. Launer, Ph.D.
Center for Conservation Biology
Department of Biological Sciences
Stanford University

Report on the 1993 status of the Bay checkerspot butterfly, Opler's longhorn moth, and the unsilvered silverspot butterfly at the proposed Lions Gate development site (Hayes Valley, San Martin, Santa Clara County)

Note that much of the background text included in this report has been included in previous reports. It is included again so that this report can serve as a stand-alone document.

Introduction

The hills southwest of San Martin, Santa Clara County, California include a significant outcrop of serpentinitic rock. Soils derived from serpentinite support a distinctive flora of native grassland species. Among these species are the larval hostplants and adult nectar sources of the Bay checkerspot butterfly, *Euphydryas editha bayensis*, a subspecies listed as threatened by the U.S. Fish and Wildlife Service (USFWS), and Opler's longhorn moth (*Adela oplerella*), a species under consideration for protection by the USFWS (Category 2R). These hills also support an oak woodland savanna with extensive areas of grassland composed primarily of non-native annual grasses. In areas such as these plants of the genus *Viola* (violets) are occasionally found in large numbers. These plants are the larval hostplants of butterflies of the genus *Speyeria*, including the unsilvered silverspot butterfly (also known as the coast silverspot butterfly), *S. adiaste adiaste*, a subspecies under consideration for protection by the USFWS (Category 2).

Habitat requirements and biology of the Bay checkerspot butterfly and Opler's longhorn moth.

The Bay checkerspot butterfly and Opler's longhorn moth are restricted to patches of native California grassland in the San Francisco Bay Area. These grasslands contain a mixture of native forbs including the larval hostplants of both the Bay checkerspot butterfly (*Plantago erecta*, the primary hostplant, and *Orthocarpus densiflorus* or *O. purpurascens*, secondary larval hosts) and Opler's longhorn moth (*Platystemon californicus*, the only known larval hostplant). These grasslands are typically rich in nectar resources, including *Achillea millifolium, Lasthenia chrysostoma, Layia platyglossa, Allium* species, *Muilla maritima, Amsinkia intermedia, and Lomatium* species. The only areas that support this mixture of grassland forbs are on patchily distributed areas of serpentine-derived soils. As a result, populations of the Bay checkerspot butterfly and Opler's longhorn moth are currently restricted to remnant patches of native grasslands that are limited in area and isolated from one another.

Variations in the timing of the adult flight period and hostplant senescence makes the Bay checkerspot butterfly highly prone to weather-induced population fluctuations. Following years favorable to the Bay checkerspot butterfly, years that favor post-diapause larval growth and prediapause larval survival, the number of butterflies may dramatically increase; some populations have been observed to exhibit a five hundred percent increase in population size from one year to the next. Similarly, following years with little spring rain, which results in the larval hostplants senescing early, the number of butterflies may decrease by an order of magnitude. Not surprisingly, Bay checkerspot butterfly populations crashed in numbers during the severe 1975-1977 drought, and a number of populations are thought to have gone extinct during this period. The population dynamics of Opler's longhorn moth are not nearly as well known. It is very likely, however, that local populations also fluctuate dramatically in number of individuals in response to weather patterns (two closely related species, *A. trigrapha* and *A. flammeusella*, have been observed to undergo large changes in population levels).

The adult flight periods of the Bay checkerspot butterfly and Opler's longhorn moth are generally similar, with the only difference being that the moth has a slightly longer flight period than the butterfly. The timing of the flight periods are dependent on weather, but March and April are the typical months when adults of both species may be observed.

Habitat requirements and biology of the unsilvered silverspot butterfly

The habitat requirements of the unsilvered silverspot butterfly are poorly known. Like other members of the genus *Speyeria* this species undoubtedly feeds on plants of the genus *Viola*. This butterfly is usually thought of as being associated with the forest-meadow areas of the Santa Cruz Mountains. There, the butterfly probably feeds on violets found in open spaces, or in seeps. Along the eastern edge of the Santa Cruz Mountains, the unsilvered silverspot butterfly has been reported from near Lexington Reservoir, and along the Santa Clara/Santa Cruz County line. There is one report of this insect from the vicinity of a seep in San Bruno Canyon (on the west side of the Coyote Valley, some 5 miles north of Morgan Hill). Unfortunately, this population is presumed to have been extirpated by the construction of a shooting range, and no specimens from this site are known to exist. Adults of this species generally begin flying in early June, and are thought to continue through July and early August. Like other silverspot butterflies, individual unsilvered silverspot butterflies exhibit a strong propensity to be attracted to plants providing abundant nectar, particularly thistles. Such behavior makes them comparatively easy to survey for, and the absence of adult butterflies at nectar sources may be taken as good evidence that a silverspot butterflies are not reproducing in the vicinity.

Results and conclusions

Prior to the 1993 season, the serpentine soil-based grasslands and nearby areas of non-serpentine woodlands adjacent to the proposed Lions Gate development site were surveyed 12 times, starting in the spring of 1985. These site visits were conducted by biologists experienced with lepidoptera and occurred on days of appropriately good weather. Most of the site visits occurred during the probable adult flight period of the Bay checkerspot butterfly and Opler's longhorn moth (as determined by their phenology at other south Santa Clara County sites). Four visits occurred during the presumed flight period of the unsilvered silverspot butterfly.

In 1993, the proposed Lions Gate site was visited on six occasions between March and June. These visits were conducted during periods of appropriate weather, during the spring and early summer butterfly seasons.

No Bay checkerspot butterflies were observed during any of the site visits, and it is unlikely that even a small population of this butterfly exists at the site. The serpentine soil-based grasslands adjacent to the proposed Lions Gate development were found to support large patches of the butterfly's larval host plants, *Plantago erecta* and *Orthocarpus* species. A number of plant species potentially providing nectar resources were also found at the site, including species of *Linanthus, Lomatium, Muilla* and *Lasthenia*. However, the predominately south- and west-facing slope exposures of the site, coupled with the comparatively low elevation, probably make the site generally too warm to sustain a Bay checkerspot butterfly population over the long-term. The serpentine soil-based grasslands present at the site, while quite microclimatically warm, are probably of sufficient quality and extent to support a small Bay checkerspot butterfly population during brief periods of favorable weather.

As was previously noted, Opler's longhorn moths are present on the serpentine soil-based grasslands adjacent to the proposed development site. They were quite common throughout the serpentine grassland in 1993, and were first recorded at the site in 1986. *Adela oplerella* is a small insect, no more than one centimeter in wing-length, and is not known to readily disperse from serpentine soil-based grasslands. As the proposed development at the site (as indicated by maps provided by Bert Verrips of Nolte and Associates) is well away from the serpentine soil-based grasslands, the proposed development should not impact Opler's longhorn moth.

No unsilvered silverspot butterflies were observed at the proposed Lions Gate development site. If not for the record of this species at San Bruno Canyon, some 15 kilometers to the north, the habitat present at this site would have been considered inappropriate for this species. While the habitat requirements of this butterfly are not well known, the oak woodland savannas and grasslands at the site are very low in elevation and dry compared to the known localities of unsilvered silverspot butterfly populations. While there are a number of creeks and seeps on the property which could conceivably support this butterfly, the lack of observations indicates that it is unlikely that a population of the unsilvered silverspot butterfly exists at the proposed development site.

SUMMARY

It is unlikely that the serpentine soil-based grasslands adjacent to the proposed Lions Gate development site have supported a population of the Bay checkerspot butterfly at any time since 1986. These grasslands are probably too warm and too

isolated to be considered a necessary component of the south Santa Clara County metapopulation of this butterfly, and the site could most likely only support the butterfly during brief periods of unusually favorable weather. In any event, questions regarding the status of the Bay checkerspot butterfly at the proposed development site are somewhat moot because, as presently specified, the proposed development would be well away from the serpentine soil-based grasslands. Since the proposed development, as presently configured, avoids the serpentine soil-based grasslands, any impacts to the butterfly by the proposed development, even if the butterfly did exist at the site, would be negligible.

A robust population of Opler's longhorn moth does exist on the serpentine soil-based grasslands adjacent to the proposed development site. However, as the proposed development avoids the serpentine soil-based grasslands, the development would, in all likelihood, not have any measurable impact on the moth.

It is doubtful that a population the unsilvered silverspot butterfly exists at the proposed Lions Gate development site. This species was not encountered by our study and it is unlikely that this butterfly exists in the oak woodland savannas of the site.

Status of the Bay checkerspot butterfly and Opler's longhorn moth at the proposed Lions Gate development site (Hayes Valley, San Martin, Santa Clara County)

12 July 1994

Alan E. Launer, Ph.D.

Report on the 1994 status of the Bay checkerspot butterfly and Opler's longhorn moth at the proposed Lions Gate development site (Hayes Valley, San Martin, Santa Clara County)

Introduction

The hills southwest of San Martin, Santa Clara County, California include a significant outcrop of serpentinitic rock. Soils derived from serpentinite support a distinctive flora of native grassland species. Among these species are the larval hostplants and adult nectar sources of the Bay checkerspot butterfly, *Euphydryas editha bayensis*, a subspecies listed as threatened by the U.S. Fish and Wildlife Service (USFWS), and Opler's longhorn moth (*Adela oplerella*), a species under consideration for protection by the USFWS (Category 2).

1994 Activities

The adult flight periods of the Bay checkerspot butterfly and Opler's longhorn moth are generally similar, with the only difference being that the moth has a slightly longer flight period than the butterfly. The timing of the flight periods are dependent on weather, but March and April are the typical months when adults of both species may be observed.

The serpentine soil-based grasslands at Hayes Valley were visited on six occasions 1994, beginning in early March. Site-visits were initiated at this time based observations taken elsewhere in the region (primarily Kirby Canyon and the Silver Creek Hills).

Results and conclusions

In 1994 the site was visited on six occasions between March and May. These visits were conducted during periods of appropriate weather. No Bay checkerspot butterflies were observed during any of the 1994 site-visits, and it is unlikely that even a small population of this butterfly exists at the site. The serpentine soil-based grasslands adjacent to the proposed Lions Gate development were found to support large patches of the butterfly's larval host plants, *Plantago erecta* and *Orthocarpus* species. A number of plant species potentially providing nectar resources were also found at the site, including species of *Linanthus*, *Lomatium*, *Muilla* and *Lasthenia*. However, the predominately south- and west-facing slope exposures of the site, coupled with the comparatively low elevation, probably make the site generally too warm to sustain a Bay checkerspot butterfly population over the long-term. The serpentine soil-based grasslands present at the site, while quite microclimatically warm, are probably of sufficient quality and extent to support a small Bay checkerspot butterfly population during brief periods of favorable weather.

As was previously noted, Opler's longhorn moths are present on the serpentine soil-based grasslands adjacent to the proposed development site. They were quite common throughout the serpentine grassland in 1994, and were first recorded at the site in 1986. *Adela oplerella* is a small insect, no more than one centimeter in wing-length, and is not known to readily disperse from serpentine soil-based grasslands. As the proposed development at the site (as indicated by maps provided by Bert Verrips of Nolte and Associates) is well away from the serpentine soil-based grasslands, the proposed development should not impact Opler's longhorn moth.

SUMMARY

It is unlikely that the serpentine soil-based grasslands adjacent to the proposed Lions Gate development site have supported a population of the Bay checkerspot butterfly at any time since 1986 --the serpentine soil-based grasslands have been surveyed on an irregular basis since the spring of 1985, and there have been no observations of this butterfly at the site. These grasslands are probably too warm and too isolated to be considered a necessary component of the south Santa Clara County metapopulation of the Bay checkerspot butterfly, and the site could most likely only support the butterfly during brief periods of unusually favorable weather. In any event, questions regarding the status of the Bay checkerspot butterfly at the proposed development site are somewhat moot because, as presently specified, the proposed development would be well away from the serpentine soil-based grasslands. Since the proposed development, as presently configured, avoids the serpentine soil-based grasslands, any impacts to the butterfly by the proposed development, even if the butterfly did exist at the site, would be negligible.

A large population of Opler's longhorn moth does exist on the serpentine soil-based grasslands adjacent to the proposed development site. However, as the proposed development avoids the serpentine soil-based grasslands, the development would, in all likelihood, not have any measurable impact on the moth.

APPENDIX G

Historical and Architectural Evaluation

Prepared by

Archives and Architecture

May 1995

HISTORICAL AND ARCHITECTURAL EVALUATION FOR THE HAYES RANCH LOCATED AT 930 AND 1005 HIGHLAND AVENUE COUNTY OF SANTA CLARA

FOR

HIX RUBENSTEIN COMPANIES
405 EL CAMINO REAL
SUITE 127
MENLO PARK, CA 94025

ATTN: Mr. Tom Hix

BY

ARCHIVES AND ARCHITECTURE
GLORY ANNE LAFFEY, HISTORICAL CONSULTANT
353 SURBER DRIVE
SAN JOSE, CA 95123 (408) 227-2657

MAY 23, 1995

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INTRODUCTION

Architectural and historical research to evaluate the potential significance of the Hayes Ranch complex at 930 and 1005 Highland Avenue was carried out in April and May 1995 for the Lion's Gate Golf Course Environmental Impact Report. The research focused upon the historical background of the owners of the property, the architectural integrity of the buildings, and the social and economic context of the ranch. The general historic context for the cultural resources is provided in the Cultural Resources Evaluation provided by Basin Research Associates, Inc. (Garaventa et al. 1994).

The complex of features and buildings at 930 and 1005 Highland Avenue, known as the Hayes Ranch, is located east of San Martin in southern Santa Clara County, California. The project area is located in Hayes Valley bounded roughly by Watsonville Road on the west and Turlock Avenue on the east. The subject parcel includes large portions of the foothill areas north and south of Hayes Valley. The historic building complex consists of about nineteen buildings that include several residences, barns, auxiliary buildings, and associated fences and corrals.

HISTORICAL BACKGROUND

Carlos Castro

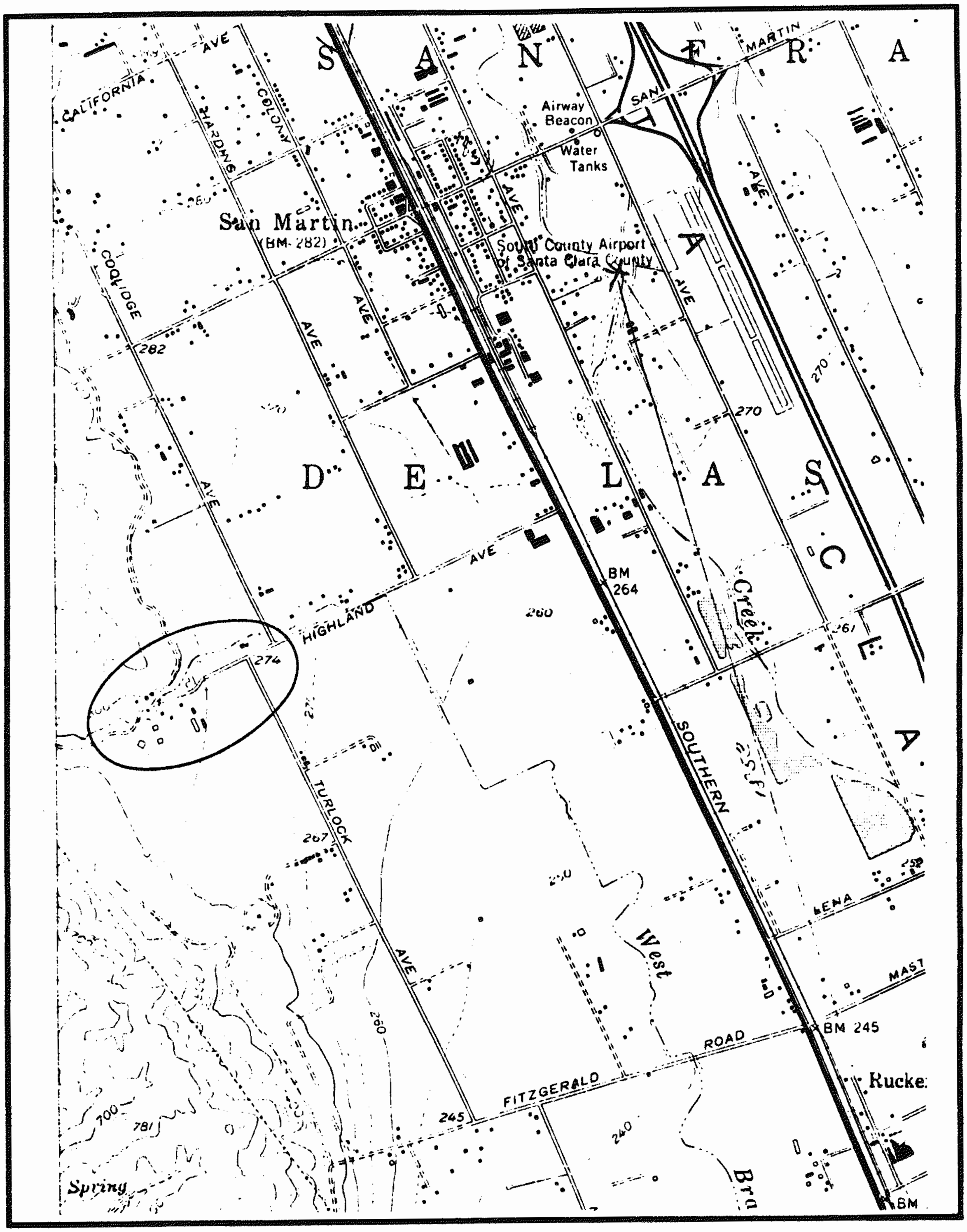
The subject property was originally included in the 26,000 acre Rancho San Francisco de las Llagas, a large Mexican land grant that included most of the area between Morgan Hill and Gilroy in the southern Santa Clara Valley. Rancho San Francisco de las Llagas was granted to Carlos Castro in 1834. Carlos was the youngest son of Joaquin and Martina Castro, colonists in Juan Bautista de Anza's 1775 expedition to California.

Joaquin Ysidro de Castro was born about 1732 in Sinaloa, Mexico, where he married Maria Martina Botiller (or Boutilliere) about 1754. According to family tradition, Martina was French or of French descent and was of noble blood. In 1775 Castro and his family were recruited by Anza for his expedition to colonize Alta California. The Castro party included seven children, ranging in age from 21 to the baby Carlos who was born on the overland march, and an eight-year-old Indian servant boy.

Castro was a soldier at San Francisco in 1777, and when Mission Santa Clara was established later that year he was sent there as a guard, where on 18 November 1777 his youngest child, Maria Isabel, was born. The Castros were among the original settlers at the *pueblo San Jose de Guadalupe* when it was founded on November 29, 1777 and were listed in the census of the pueblo in 1778. At that time Carlos was three years of age. Joaquin Castro had apparently returned to duty in San Francisco by 1779, for in July of that year, little Maria Isabel was buried at Mission Delores. Castro was not among the *pobladores* [settlers] at San Jose who were assigned house lots by Lt. Moraga in 1783; however, Bancroft places him in San Jose in 1790 (Hall 1870:27-28; Bancroft 1886 III:751; Northrop1976:94-95; Rowland 1980; Castro 1975; Waid 1991).

In 1795, when land grants were first made available to deserving settlers, Joaquin Castro and his son-in-law, Jose Maria Soberanes, both retired from military service, jointly requested a land concession. They were given Rancho Buenavista, approximately 8000 acres in size, on the western bank of the Salinas River near present day Spreckels. The Soberanes with their five children, the elder Castros and several of their grown children and their families occupied the rancho where they worked together to build a house, plant crops, and raise cattle.

Map 1. Project Location Map



GILROY, CALIF.

N3700-W12130/7.5
1955
Photorevised 1981

By 1805, Carlos Castro had entered military service. While stationed at the presidio in Santa Barbara, he met and married Maria del Rosario Garcia. The couple was living at Rancho Buenavista in February 1806 when their first son was baptized. Carlos was majordomo at Santa Cruz Mission in 1812-13 and of Mission Santa Clara in 1820 (Bancroft 1885). By 1819 Carlos has been assigned a cattle brand by Sergeant Luis Maria Peralta, *comisionado* at the pueblo of San Jose (Fox 1975). He retired from military service in 1827 and was living in San Jose where he served on the council in 1828. He also was elected to the territory assembly in 1828, serving as an officer when the assembly met in San Diego. He also served in the territory assembly in 1829.

Land Case documents include a letter written by Carlos wherein he states that he occupied the *Rancho San Francisco de las Llagas* in 1828. Jose Hernandez testified in 1853 testified that in 1827 or 1828:

> He [Castro] first placed there about 500 head of cattle which was subsequently increased to about 2000 and 100 head of horses. In the same year he built two houses on the land and corrals for the cattle. He occupied one of the houses with his family and the other was occupied by his hirelings. He also enclosed some of the land, planted an orchard, had a garden and cultivated a portion of the land.

Other testimony reported that Castro cultivated about 500 acres that included a vineyard. Governor Figueroa officially granted the rancho to Carlos in 1834 (Land Case ND147). There was also a reference in the Land Case records to a soap factory that was located on the rancho. Because of the distance of the ranchos from other settlements and villages, the rancho hacienda was similar to a small self-sufficient village that produced and manufactured most of the food and commodities needed to subsist. The rancho also produced commodities that could be traded for items or luxuries that could not be locally produced. Items commonly produced by the ranchos were hides and tallow. In the southern Santa Clara Valley soap was also produced. These commodities were taken to Monterey where the rancheros traded with merchants such as Thomas Larkin or with the ships anchored in the bay.

Soap was made at several of the south county ranchos from *tequesquite*, an alkali substance harvested from the plain south of San Felipe Lake, then known as Soap Lake, about three miles east of Old Gilroy. The *tequesquite,* or sodium carbonate, was added to tallow and the other ingredients, then boiled, solidified, and cut into bars. Received in trade, Monterey merchant Thomas Larkin sold the soap to sailors, who liked it because it lathered easily with sea water (Nelson 1981). Letters written to Larkin in the 1840s indicate that soap-making was a thriving business involving many residents in the Gilroy area (Hammond 1952). Undoubtedly Castro was producing soap for his own use; and although it is not specifically mentioned in this context in Larkin's papers, it is very possible the Castro rancho was also making soap for trade.

Carlos and Maria del Rosario Castro had two sons and several daughters. Nothing of the older son, Juan Jose, is known beyond his birth and baptism. Guillermo, the second son, married Maria Luis Peralta at Mission Santa Clara and was living in San Jose in 1831. The young couple was living with the elder Castros at *Rancho Las Llagas* in 1836 where they lived from 7 to 10 years. At this time there were twelve people living at *Rancho Las Llagas*. In 1835, Carlos was appointed an auxiliary *alcalde* (justice of the peace) for the vicinity surrounding his rancho, and in 1839 Carlos was elected as a substitute representative *(vocale)* to the territorial assembly in Monterey (Bancroft 1886). In 1841, Guillermo was granted a rancho in Contra Costa County where he established his home (Castro 1975; Waid 1991).

In 1843, Indian troubles caused Carlos Castro to petition the Governor to withdraw his cattle and temporarily abandon the rancho for about a year (Land Case ND147).

By 1847 Carlos Castro was about 72 years of age. Apparently, by this time Carlos was unable to manage the rancho by himself. Court records show that in May 1847, Guillermo entered into an agreement with Benigno Ceseña whereby Ceseña agreed to care for a herd of 500 cattle. Castro also provided 15 gentle horses, a yoke of six oxen, a quantity of seed and a house for Ceseña's use during the period of the agreement.

In July 1847, Chester S. Lyman visited the ranch and found Carlos in good health and residing at the ranch (Lyman 1924). On July 23, 1847, Lyman noted in his diary that:

> About 5 we passed Carlos Castro's Ranch, in a nook of the hills at the right. Here we left most of our horses, they being too tired to proceed further. Near the house was a grizzly Bear tied by a rope to a tree, & at a little distance a young fawn. The bear was partially tamed.

Returning from Monterey later in August, Lyman again stopped at the rancho recording detailed observations about his visit:

> [Leaving Monterey we reached] our stopping place at Senr Castros, at 43/4.
>
> Senr Castro & his wife at the door rec'd us kindly, & as they saw that I was somewhat tired with my ride of some 45m a bed was soon spread under the corridor on which I was invited to rest myself. But not feeling sufficiently weary to indulge myself we all walked into the fine fields of corn etc near the house. Onions, peppers, turnips, cabbages, melons, squashes etc were growing in perfection. The lady was quite disposed to be talkative & with my scant knowledge of the Spanish I contrived to hold quite a chitchat with her, for the conversation went on even tho' I c'd not understand what she said.
>
> The house is of adobes with the earth for floor, a dismal looking place. On the mud wall on one side of the room was a picture of Santa Barbara in a gilt frame & another of Our Savior bearing his Cross. On the opposite was a small crucifix & rosary, picture of the Virgin etc, etc. In the same part of the room were two beds; a table, bench & trunk or two completed the furniture of the house. Half a dozen children were playing around which the good matron seemed to take much honest pride in. . . .
>
> Preparation for supper commenced soon after we arrived—several vessels were heating over a large fire out of doors, a quantity of Green Corn was brought from the field, & just at night a fine fat sheep was slaughtered & dressed at the door. Being tired & hungry I was in dismay when I found that the animal w'd have to be dressed & cooked before I could have supper it being near eight oclock before it was dressed. At length however, a cloth was spread on one side of the table where the bench stood, several plates were placed, & the smoking ribs appeared fresh from the fire. They were divided into small portions & distributed on plates by the good lady; a large dish of boiled green corn & another of cheese were bro't on & we were invited to take our places. Another & myself took seats on the bench, the rest stood up. Looking for my knife & fork I found none & a glance showed me that none were necessary for all took hold with their fingers, an ear of corn in one hand, & a rib of mutton in the other. I of course did the same. The mutton was very sweet & the

corn delicious, the first I have tasted in the country. When we had done justice to these two dishes, the plates were removed, washed by the land-lady & her daughter & sent back filled with a stew of squash, called here Calabasa, which was indeed very excellent; to eat this we had iron spoons. This was followed by a dish of stewed dried pears & the meal closed with coffee in large bowls with large iron spoons. On the whole I made a most excellent supper, tho' it was after 9 before it was finished. There being 4 strangers present I had some curiosity to know how we were to be disposed of. Presently however I was directed to my bed spread on a bench outside the house under the corridor, & a large bed which our host & hostess usually occupied was brought & spread by the door for the rest of the strangers, our kind entertainers spreading some sheeps wool on their wooden bedframe & preparing a rude sleeping place for the night. Tho' I had little but the bright starlit sky above I wrapped myself in blankets & had a good nights sleep. . . .

The morning was clear & beautiful, with a bracing air of about 62°. Taking a hasty breakfast of roast corn & fried mutton, at 7 ock we started on our [way]. . .

According to Hubert Howe Bancroft, Don Carlos Castro was described as "an eccentric old fellow, who tempered his hospitality by an affectation of abusing his guests" (Bancroft 1886:750). It doesn't appear that Lyman suffered abuse from his host.

Carlos Castro died in June or July 1848. In August 1848, Guillermo sold the rancho, including all cattle and horses, to Daniel and James Murphy for $6000. Charles White, *alcalde* (mayor) of San Jose recorded that Guillermo's wife and two sons, Maria Luis Peralta and Juan and Ramon Castro, understood and consented to the sale of the property. In 1852, Castro's widow, Maria del Rosario Garcia also signed an agreement that she had approved of the sale of the property (Land Case ND147).

Due to a penchant for gambling and struggles protecting his Contra Costa County rancho from aggressive American settlers, Guillermo lost title to all of his lands. Greatly embittered, Guillermo moved with his wife and children to Chile in 1865 (Waid 1991).

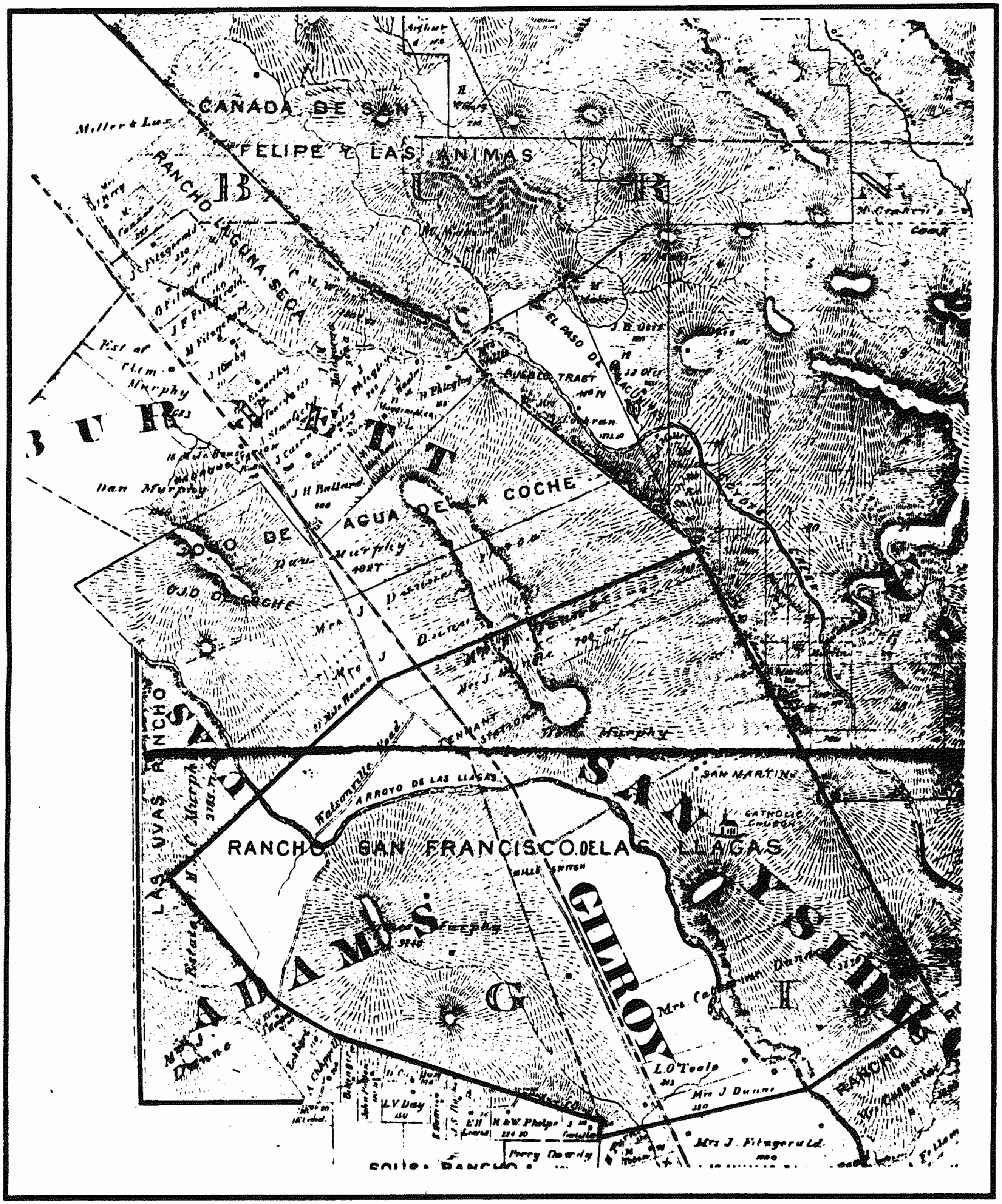
The Murphys

Daniel and James Murphy were the sons of Martin Murphy, Sr. who had brought his large extended family to California in 1844. The Townsend-Stephens-Murphy party was the first overland immigrant party to successfully bring wagon trains across the Sierra Nevada mountains. Their trail through the Truckee River-Donner Pass region opened up the most direct and practicable overland route that was followed by thousands of pioneers who followed. This route was later followed by the transcontinental railroad and is now known as U. S. 80 Interstate (Arbuckle 1985:64).

Upon arrival in California, many of this immigrant party settled in Santa Clara County. The Murphys became involved in lumbering, cattle raising, farming, and trading. Martin Murphy, Sr. purchased *Rancho Ojo de Agua de la Coche* in 1845. The Town of Morgan Hill was later established on this ranch. After the discovery of gold in January 1848, several of the Murphys were among the first to engage in placer mining. Daniel and John Murphy established rich claims in an area now known as Murphys where they also set up a trading post.

With the fortunes acquired during the early gold rush, several of the Murphy brothers purchased large parcels of land in Santa Clara County and elsewhere in the state. In 1848

Map 2. 1876 Map of Rancho San Francisco de las Llagas



Thompson & West Historical Atlas, 1876

Daniel and James purchased *Rancho San Francisco de las Llagas* that abutted the southern boundary of their father's *Rancho Ojo de Agua de la Coche*. Bernard purchased *Rancho La Polka* on the east boundary of *Rancho Las Llagas* and *Rancho Las Uvas* on the western boundary of *Rancho Ojo de Agua de la Coche*. Martin Jr. purchased *Rancho Pastoria de las Borregas,* which now comprises the cities of Mountain View and Sunnyvale. These five ranchos included more that 51,000 acres of the Santa Clara Valley. Daniel also acquired vast properties in Nevada and Mexico. Known as the Cattle King of Nevada upon his death in 1882, he owned over 1,500,000 acres and was thought to be the largest land owner in the world (*San Jose Daily Mercury* 1882).

In 1851 Daniel sold half his interest in the Las Llagas ranch to his brother Bernard Murphy for $10,000. In 1853, Bernard was killed in the explosion of the steamship *Jenny Lind* on the way to San Francisco. Bernard's widow and young son, Martin J. C. Murphy, fell heir to Bernard's third interest in the Las Llagas ranch. After the United States patented the rancho in 1868, the property was divided between the various members of the Murphy family that held an interest. The subject area was included in the parcel acquired by James Murphy, which consisted of 9246 acres west of Monterey Road.

Born in Ireland in 1809, James was the second son of Martin Murphy, Sr. Upon his arrival in California with his family in 1844, he settled in Marin County where he engaged in the lumber business furnishing timbers for the first wharf built in San Francisco. Unable to keep employees after the discovery of gold, his lumber operations came to a halt and he also left for the mines. After several successful months in the Mother Lode, he brought his family to Santa Clara County in the fall of 1848, where he purchased the *Rancho San Francisco de las Llagas* with his youngest brother, Daniel. In 1849, James also purchased 2500 acres northeast of San Jose where he established the prosperous Ringwood Farm and made his home.

James Murphy died in 1888 at Ringwood Farm, leaving the management of his extensive properties in the hands of his son, Daniel J. Murphy. Ringwood Farm was devoted to extensive orchard operations and the Las Llagas property was utilized for stock raising (Foote 1888; *San Jose Herald 1888*). The southern portion of the Las Llagas Ranch south of Fitzgerald Road was subdivided in 1885 as the James Murphy Subdivision, forming orchard lots of 10 to 125 acres in size. Seventeen hundred acres west of Watsonville Road was acquired by James Murphy's daughter, Mary, and her husband, Barney Machado.

Research did not reveal if the Castro hacienda was used by the Murphy's. James may have occupied those buildings for a short time in 1848 and 1849 while his Ringwood Farm home was under construction. All of the Murphys had constructed homes at other locations and it is likely that occupying the old adobe structures held little appeal for the upwardly mobile Murphys. As is the nature of adobe construction, if the buildings are not properly maintained, they can quickly deteriorate. The winter of 1849-50 is known to have been unusually wet, which would have added to maintenance problems. If the adobe buildings were at all suitable for occupation, they may have been used by ranch employees. The 1876 Historical Atlas for Santa Clara County indicates a building in the approximate location of the Hayes Valley complex. This building may have been a remnant from the Castro hacienda or a structure erected by James Murphy for his employees.

The Lions

In 1890, Lazard Lion purchased 5582 acres from the James Murphy estate. A native of the Alsace-Lorraine region of France, Mr. Lion settled in San Francisco in 1853 where he established the City of Paris dry goods store. Retaining his business interests in San

Plate 1. James Murphy

(H. Foote, 1888)

Francisco, Lion moved to San Jose in 1855 and established a general merchandise store. In subsequent years, he also established merchandise stores in Santa Clara and Sacramento, established a tannery and glove factory, and assumed the presidency of the Commercial and Savings Bank of San Jose (Sawyer 1922).

Lazard Lion married Zuelma Martin in San Francisco in 1857 and the couple had five sons and a daughter. The eldest son died young and the others followed their father into the business world. Gustave Lion, born in 1859, attended schools in San Jose and Santa Clara. He established a dry goods store in San Jose in 1880 which he sold before moving to Los Angeles in 1886. Finding Los Angeles undergoing its first real boom, Gustave established an exclusive carpet store. Upon his father's retirement from active participation in the business, Gustave sold his Los Angeles business in 1890 and returned to San Jose to assume the presidency of L. Lion & Sons (Sawyer 1922).

The L. Lion Company purchased the James Murphy property near the village of San Martin in 1890. The village of San Martin had developed around the Daniel M. Murphy ranch about two miles east of the present San Martin commercial area. In 1893 the property between the Murphy ranch and Mills Station was subdivided for the town of San Martin. The community first appears in the City Directories in 1895 when it was described as:

> A new town on the Coast Division of the Southern Pacific system, 24 miles south of San Jose, 8 miles north of Gilroy. The town has a post office, telephone, telegraph and express office. The closest banking town is Gilroy.

It appears that upon Lazard Lion's retirement from business, he began the development of the Las Llagas ranch. Listed as an orchardist, he first appears in the City Directory as a resident of San Martin in 1899 where he remains until his death in 1911. In 1898 Lazard Lion filed a claim to water from Las Llagas creek "for the purpose of irrigation, power, and domestic uses on the ranch known formerly as the James Murphy Ranch." Diversion plans included the construction of dams, excavation of ditches, and the use of flumes and pipes (Water Claim 1898).

In 1901, Frenchman Amaury Mars published the memoirs of his visit in Santa Clara County. Included in this work is an extensive and flowery description of his visit to the Lion Ranch. The following has been excerpted from Mars description (Mars 1901:58-63):

> We continued our journey to visit the property of Mr. Leopold [sic] Lion. Along the country road, the view present to one's sight is that of an immense oval expanse of land. No scenery can be more picturesque than this extent of country, seemingly framed with mountains.
>
> What a sight it was to behold all those old oaks and majestic sycamores. One's eyes actually glisten with pleasure while surveying that rural picture formed of pastures, grain fields and orchards, all teeming with a vegetation that seems to expand beneath the sun's golden rays.
>
> We sped along a well constructed road, undulating to the right, which is sprinkled every day, and it was not long before the southeastern section of the San Francisco de Las Llagas Ranch was reached. It is a vast stretch of land, hilly in portions and triangular in shape. A chain of hills from 300 to 400 feet in height, divides the property into two portions. . . . On each side of this chain of hills, the land inclines in a succession of plateaus; a formation tending greatly to facilitate the flow of water.

> The first of these plateaus, having a circumference of about three miles, is planted in barley, alfalfa and corn, and at its base, a magnificent terrace stretches out, darkened by the luxuriantly spreading branches of the fruit trees.
>
> The Llagas Creek, which is a branch of a river, and the source of several springs, flows along the north part and in the rainy season is deep and full of flowing water. Owing to this advantage a magnificent system of irrigation has been devised, by means of which the water is conducted through metal pipes in all directions on the plateau exceeding a distance of two miles.
>
> . . . and only ten years ago, it was but a vast uncultivated field, covered with a growth of wild plants, brush, oaks and sycamores.
>
> It would require a visit of several days in order to enable one to form a perfect idea of the entire place; for instance, it takes several hours to go through the orchard, which contains some 330 acres of land, all planted with the choicest varieties of fruit trees. It is impossible to describe the effect produced of the sight of those 30,000 trees, with branches laden with fruit, bending nearly to the ground; and while brushing against them, one is constantly tempted to stretch forth his hand, and pluck here, a savory peach; there, a golden juicy apricot or one of those sweet refreshing prunes. These surroundings are a delight for the senses of sight, smell and taste.
>
> The great part of the ranch (consisting of 5,582,550 [sic] acres) was sown in barley, and at the present time the glorious expanse of ripening bearded heads appears to the eye like a carpet of silver and gold. The crops this year have been most gratifying as a result of the efforts made by the intelligent men at the head of this great enterprise. . .

The photograph of the Lion Ranch that accompanies this description shows at least 10 buildings and barns, several that may correspond to buildings currently at the site (Mars 1901:61). A 1915 map for the proposed South Santa Clara County Irrigation District notes that the L. Lion Estate property consists of "1852 acres of valley land and 300 acres of orchards." This map also shows the ranch headquarters as a complex of more than 35 buildings located at the end of what is now Highland Avenue (Swickard 1915).

After his father's death in 1911, Gustave (Gus) Lion continued as the ranch manager until the property was sold in 1921 to Frank Hayes. Gustave Lion passed away in 1923 at the age of 64. In the 1920s L. Lion & Sons opened a furniture store on South Second Street in San Jose. The company continued under the management of succeeding generations of the family until its closure in 1967 (Pierce 1990:128).

The Hayes

Sawyer's *History of Santa Clara County* recorded that in 1922 San Martin was a small village of about 250 people. Situated on the Southern Pacific railroad line and the State Highway, commercial development at that time included a store, cannery, several blacksmith shops, and a lumberyard. The community also had a school and a Presbyterian church. Sawyer noted that the "great Lion Ranch" had been recently sold and expectations were that it would be subdivided for small ranches (Sawyer 1922:305).

Originally a cattleman in Tulare County, Frank Hayes entered into a partnership with the Lion Company in 1918. Hayes acquired about 2500 acres of the Lion property, as well as leasing additional grazing land in Pacheco Pass and Gilroy. Hayes with his son, Carroll, used the foothill portions of the ranch to graze cattle. They also maintained walnut and prune orchards, had a 40 acre vineyard, operated a dairy that produced milk and butter, and raised hay and grain (Hayes 1995).

Arch Hayes, Frank's great-grandson, believes that the Lion's large Victorian ranch house burned down about 1919 and the "little redwood house" now occupied by the Ukestads was constructed about 1920 served as the main residence. It was this residence that was occupied by Frank Hayes. The residence at 930 Highland Avenue, according to Arch Hayes, was the home of Mr. Garcia, the Hayes' ranch foreman.

Arch Hayes also related the story of how the Hayes Valley got its name. During the Depression, one of the projects of the California Conservation Corps was to survey unsurveyed lands for the Geodetic Survey. While surveying the more remote regions of the ranch, the surveyors asked Frank Hayes the name of the valley. Up to that time it had just been called "the canyon." When USGS published the new topographic maps of the area, the "canyon" had acquired the name of Hayes Valley.

Upon Frank's death in the early 1950s, the ranch was divided between the Hayes children. Carroll Hayes retained property along Watsonville Road, and in 1953 his siblings sold the subject area to Eugene Salvage, owner of the Lucky Hereford Company (Hayes 1995).

Ownership since 1950

The property was sold to Eugene Salvage in the early 1950s. Salvage was the owner of the Lucky Lager Beer Company (Silacci 1995). Salvage occupied the property while operating the cattle ranch.

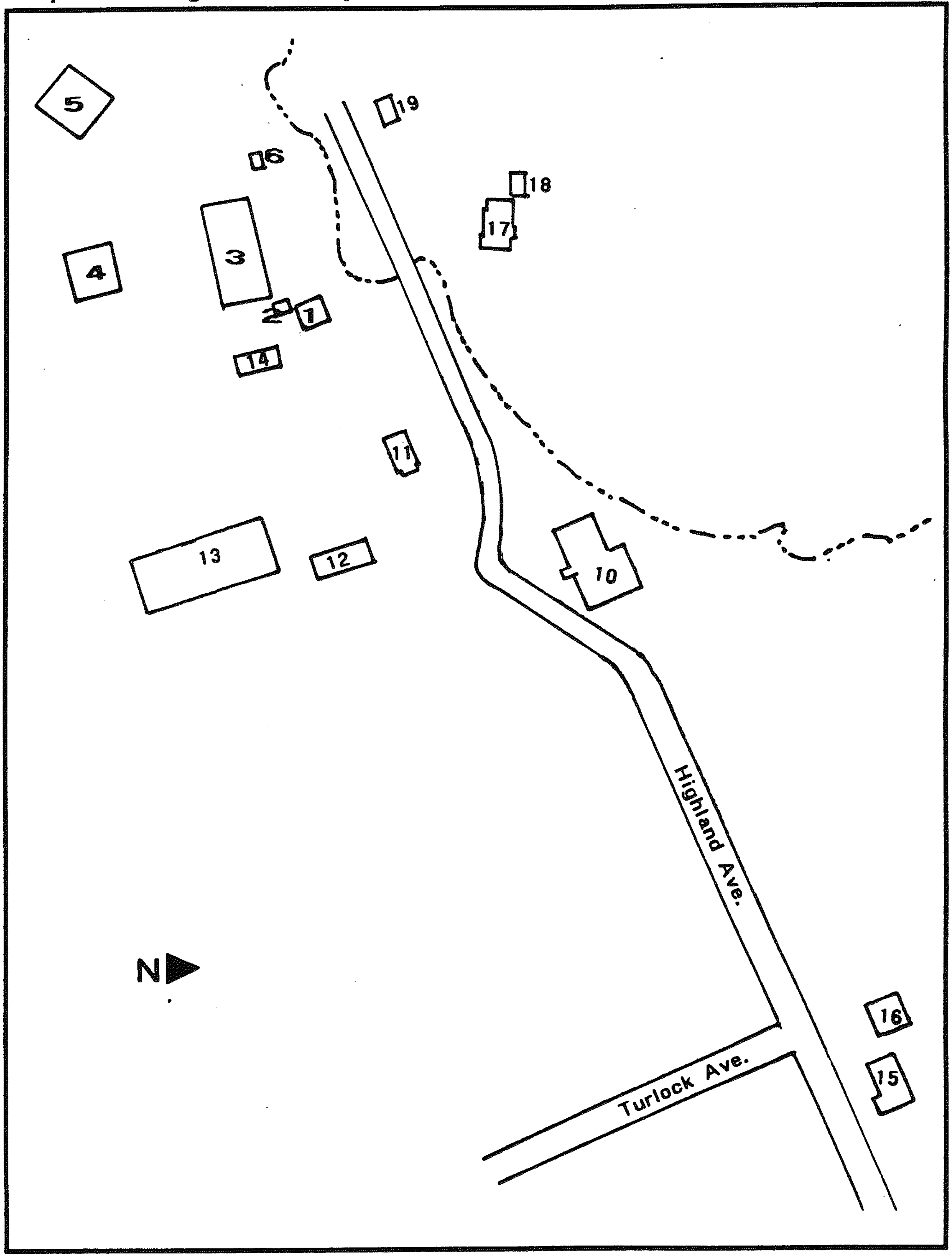
In the late 1960s, the Lucky Hereford Company sold the property to Roy Monschke. Maintaining the buildings on the ranch, Monschke leased the land for grazing and rented the residences. The Hayes ranch house is currently occupied by Robert and Royanne (née Monschke) Ukestad (Ukestad 1995).

HISTORIC RESOURCES

Historical resources that exist within the study area include structures associated with the Lion and Hayes ranching operations, and potential subsurface historic archaeological deposits dating to the 1828-1850 period. The historic archaeological component is included in recorded archaeological site CA-SCl-76. The description, evaluation and recommendations for the archaeological aspects of the project are discussed by Basin Research Associates, Inc. (Garaventa et al. 1994).

Over nineteen buildings are included in the historic complex located at 930/1005 Highland Avenue. During the historic period, this site was originally settled by Carlos Castro in 1827 or 1828 and formed the nucleus of the hacienda for Rancho San Francisco de las Llagas granted to Castro in 1834. During this period buildings included at least one, and probably two, adobe residences and a building known as the soap factory. It appears that sometime shortly after the Murphys purchased the rancho in 1848 the hacienda buildings were abandoned. The site was again occupied in 1890 when the property was acquired by the Lion Company. All the buildings currently on the site appear to have been constructed after 1890. The following discussion identifies the primary buildings in the complex, and provides a description and any developmental history that is known. For purposes of identification, survey numbers have been arbitrarily assigned to each of the buildings. The discussion is keyed to a map that indicates the location and building survey number.

Map 3. Building Location Key



1. Yellow Residence

The residence is a one story, front gabled, rectangular structure. The building is sheathed in channel rustic siding with corner boards. The roof has asphalt shingles and open, overhanging eaves with exposed purlins and rafter ends. There are shuttered attic vents in the peak of the gables. Fenestration includes vertical two-over-two paned windows with double hung sashes. A recent modification includes a horizontal window on the rear elevation. Entrances are located on the front, side and rear of the building. The front entrance is off-center. All windows and doors have plain surrounds. A chimney is located on the eave wall and appears to be an addition. A small enclosed porch with a shed roof is located on the southwest corner of the building.

This building appears to date from the 1890s and can be seen in the 1901 photograph of the Lion Ranch. The siding and window types are consistent with a circa 1890 construction date. The roof was probably replaced during the early 20th century.

2. Shed

This small building features a front gabled roof with enclosed eaves. The building is clad with board-and-batten siding with frieze board in the rake of the gable. Windows are small with fixed panes. An addition with a low-pitched shed roof and vertical siding is attached to the north side.

Vernacular construction such as this is often hard to concisely date. Based on its all-wood construction and board-and-batten siding, construction appears to date to the early 20th century.

3. Double Barn

One of several barns on the property, this large, long building features a double gable with raised ridge vents. The roof is covered with corrugated metal sheets. The overhanging eaves are unenclosed with exposed rafters. Some portions of the barn are clad with board-and-batten siding; however, most of the building is clad with vertical boards. The floor is concrete.

Although partly obscured by trees, there appears to be a barn in this location in the 1901 photograph. Comparison of the 1915 and 1994 maps show footprints that are similar and seem to correspond to this building. It is possible that this structure dates to before 1901.

4 and 5. Barns

These two barns are similar in size and form. They have broad gables with open eaves. The roofs are covered with corrugated metal sheets and the gable walls are clad with vertical boards that have been cut with a circular saw. The eave sides are open and the roof is supported by bracketed posts. The barns are surrounded by a system of corrals. Corral fences have horizontal wood rails. Near Barn #5 there is a cattle loading shoot.

These barns do not appear in the 1901 photograph. There is a barn in the approximate location of Barn #4; however, it is obviously not the current building. By comparing building footprints on the 1915 map and the 1994 project map, it would appear that Barn #5 was constructed before 1915 and Barn #4 at a later date.

6. Shed

This small gabled shed has an open porch on the gable end. The roof is covered with corrugated metal sheets. The overhanding eaves are enclosed with a fascia board. The building is clad with flush horizontal siding with corner boards. A small window is unglazed. A scar on the eave wall indicates that an entrance has been closed off. The entrance on the gable end has a paneled door. The shed-roofed open work area on the west end of the building has a concrete floor.

7, 8, and 9. Small Structures

These structures consist of small sheds and feed managers of recent construction.

10. Barn

This barn is located on Highland Avenue near the entrance to the main building complex. This building consists of one large section and two smaller sections, all with gables that face the road. The larger section has a dual pitched roof covered with corrugated metal sheeting. There are no gable rakes on any of the sections. The buildings are clad with vertical boards. The upper portion of the gable on the larger section has battens. Doors on the barns slide in metal channels. The east wall of the building is open with half-walls. The barn sits on a formed concrete foundation. Attached to the eastern side of the building is a cattle loading shoot, and corrals are located at the sides and rear of the structure.

It would appear that this structure was built in at least two phases. A barn in this location was sited on the 1915 map. The double gabled section on the west side was probably added at a later date.

11. Barn

This structure appears to be large dairy barn. It has a broad low-pitched roof with a raised ridge vent. The roof is covered with corrugated metal sheets. The sides are open and the building is surrounded by corrals. It does not appear on the 1915 map, but is sited on the 1955 USGS map. It is probably associated with the Hayes era dairy operation.

12. Creamery

This building has a low-pitched gabled roof. The roof has overhanging eaves and a close rake. The roof is covered with corrugated metal sheeting punctuated by small rotating vents. The building is clad with stucco or plaster siding. Fenestration included metal-framed casement windows. There is a raised loading dock on the north end of the structure.

13. Residence

This residence may have replaced the Lion's Victorian house that burned about 1918. One informant believes that the house was occupied during the 1940s by the Garcia family. Mr. Garcia served as foreman for Frank Hayes (Hayes 1995).

The residence is a one-story bungalow with a low-pitched hipped roof and an integrated porch. The wide over-hanging eaves have exposed rafter tails. The building is sheathed with trilap (or false beveled) bungalow siding. The front porch is enclosed forming a sun room. With the exception of the porch, fenestration included one-over-one double-hung sash windows with wood frames. The building appears to be in good condition. It is surrounded by a large, well-maintained, fenced yard that includes lawn and mature palm, redwood, and eucalyptus trees.

14. Shed

This building is a long one-story building with a gable roof. There is a one-and-a-half story section at one end. The roof is covered with corrugated metal sheets. The gable rake is close, and the eaves overhang slightly with exposed rafter tails. The building has a concrete foundation and is sheathed with vertical boards. The building was constructed after 1955.

15. Residence

This residence is located on Highland Avenue near the Turlock intersection. The house was constructed in two phases resulting in a cross gabled roof line. One building phase consisted of a simple rectangular bungalow with a side-gabled roof. The over-hanging eaves have exposed rafters and the gable has triangular eave braces. This section of the building is sheathed with trilap or false bevel bungalow siding. A large chimney was added to the front of this section. At right angles to this section is a wing with gable-on-hip roof. The front of the wing has a slanted bay. This section has been sheathed with plywood-and-batten siding. Fenestration consists of double-hung wood frame sash windows. Each sash is divided horizontally. A porch has been added across the front of the house in the ell of the wing. It has a shed roof and is supported by double posts that are canted at an angle.

This building is surrounded by a wide expanse of lawn. Associated with this building a raised water tank and a barn (#16). The water tank is constructed of redwood staves with iron rings. The supporting frame was obscured by dense vegetation.

16. Barn

Associated with Residence #15, this one-story barn has a gable roof with overhanging eaves. The roof is covered with corrugated metal sheets and the building is clad with vertical boards and board-and-batten siding. The addition on the west elevation has a shed roof.

17. Residence

This house is a basic side-gabled rectangular vernacular style with a two-story addition on the eastern end. The building is constructed on the side of a hill and has a raised foundation and porch. The older section of the house has overhanging eaves with exposed rafter tails. The wrap-around porch has an open balustrade and a shed roof supported by braced posts. A bay window has been added to the northwest corner. The two-story addition has plywood siding. The addition has a two-story slanted bay window and a balcony. All the fenestration consists of metal frame windows.

18. Guest house

This small one-story building has a side-gabled roof with a full porch. There are two entrances from the porch, which has a shed roof. The building is clad with board-and-batten and plywood siding. Fenestration consists of two-over-two double-hung sash windows with wood frames.

19. Barn

This small barn has a gabled roof with overhanging eaves and exposed rafters ends. The building is clad with board-and-batten siding. There large doors glide in metal channels.

Evaluation for Significance

All the buildings within the subject area were constructed after 1890 and were associated with ranching and farming activities. Although located within a recorded archaeological site, none of these buildings have been previously identified as potentially significant resources. As part of this study, all the structures were evaluated for historical and architectural significance according to the National Register of Historic Places. State historic inventory forms are included in Appendix 1.

The County Historical Heritage Commission uses the National Register criteria to determine eligibility for listing in the historic inventory. Therefore, even though no federal actions are involved in this project, the standards for the National Register of Historic Places are used for this evaluation. To meet National Register standards, a property must 1) be at least fifty years old; 2) meet at least one of the criteria listed below; 3) possess architectural integrity; and 4) be evaluated within the context of the area's local history. Criteria for eligibility include: a) association with events significant to broad patterns of history; b) association with significant personalities in our past; c) have distinctive architectural characteristics of type, period, or method of construction; or d) have yielded or are likely to yield important archaeological information on the history of the area. Each of the resources in the subject area are evaluated both for possible individual significance and as a contributing structure to a potential historic district.

For about 80 years the property was utilized as a large ranching and farming operation that included fruit production, dairying, and cattle grazing. Most of the buildings in the complex exceed the age of 50 years. All of the buildings currently on the property appear to be relatively well-maintained and most retain architectural integrity. None of the buildings, however, represent distinctive architectural types, periods, or methods of construction as per criterion C.

Criterion A addresses the association of the buildings with events significant to broad patterns of history. Cattle ranching was the primary economic activity in the Santa Clara Valley from the 1830s until about the 1870s. Wheat and grain became basic crops during the 1850-1880 period to be replaced by fruit production during the 1890s. Cattle ranching continued as a important economic activity in the southern part of the valley, especially in the foothill areas, well into the twentieth century. In the late decades of the century, valley acreage of the large ranches were broken up into smaller ranches and farms of several hundred acres. As horticulture became more popular, properties were further subdivided for family orchards. The property subdivision and land use of the Hayes Valley property was typical of land use patterns in the valley. There were no significant events identified that associate this property with broad agricultural or land use patterns.

Criterion B addresses the association of the resources with significant historic personalities. Lazard Lion was an early and prominent merchant in San Jose and the Lions were in business in San Jose for over 100 years. Although members of the Lion family were involved in many of the 19th century developments in the City of San Jose, they did not make significant contributions that can be directly related to the Hayes Valley property. Frank and Carroll Hayes were also prominent cattlemen in Santa Clara County. Carroll was the founder and first president of the Santa Clara County Cattlemen's Association. These activities, however, do not have sufficient significance to satisfy criterion B.

Criterion D addresses the potential for yielding important archaeological information on the history of the area. Under frontier conditions, a rancho hacienda was a small, self-sufficient village that, in addition to the main residence, could also include auxiliary residences for vaqueros (cowboys) and Indian labor, kitchen, privies, granary, ovens, wells, spring house, blacksmith shop, tanning vats, trash deposits, corrals, and gardens and orchards. Most of the building materials would have also been manufactured locally. Barrow pits for the making of adobe bricks and kilns for firing roof and floor tiles would have been located nearby. The remains of these types of resources would be important in furthering a more complete understanding and interpretation of the development of the Hispanic frontier.

Based on this preliminary archival study, the potential for significant historical archaeological deposits associated with Castro occupation period (1828-1848) is highly likely. The determination of the presence and integrity of subsurface resources, however, is beyond the scope of this study.

CONCLUSIONS AND RECOMMENDATIONS

Based on the preceeding evaluation, it is concluded that the Hayes Valley building complex does not constitute a significant historic district and that none of the structures are individually eligible for the National Register of Historical Places or for listing in the Santa Clara County Heritage Resources Inventory. There is a potential, however, for significant subsurface historical resources that may yield important archaeological information on the history of the area according to criterion D of the criteria for significance.

The proposed project calls for the demolition of all buildings except residence #13, residence #17, building #18, and barn #19. The demolition of buildings and construction of a golf course will not impact signficant historical buildings.

The historical component of archaeological site CA-SCl-76 may be impacted by building demolition or earth moving activities associated with ground preparation and residential, road, and golf course construction (Nolte & Associates 1994; Jones 1994). Construction activities that disturb the ground surface beyond a depth of twelve inches may constitute a significant impact to the site.

All recommendations for the evaluation of historic archeological resources should be consistent with the recommendations made by the archaeological consultant for CA-SCl-76. If avoidance of this site is not feasible, additional research, testing and evaluation is recommended. Additional research should specifically address the location of Hispanic and early American period structures and activities. Archival research and subsurface testing should reveal the integrity of the site and provide data needed to the further development of a research design for a focused testing and data recovery program.

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San Jose Daily Herald
1898 Mrs. Lion Dead. November 22, 1898, p. 8:5.

San Jose Daily Mercury
1882 Dan Murphy's Death--Short Sketch of One of the Pioneers of this County. October 23, 1882, p. 3:5.

1882 The Funeral--Imposing Obsequies Over the Remains of Daniel Murphy. October 25, 1882, p. 3:1.

San Jose Herald
1888 Jas. Murphy Dead. January 14, 1888, p. 3:8.

San Jose Mercury-Herald
1933 Mrs. Mary Lion, Well-Known S. J. Matron, Passes. July 12, 1933.

1946 Funeral Services Set For Mrs. Clara H. Lion. January 26, 1946.

1954 Morrell Lion Heads Pioneer S. J. Store. April 13, 1954.

Santa Clara County
1862 Tax Roll. (On file at San Jose Historical Museum)

1867-1894 Great Register of Voters. (On file at San Jose Historical Museum)

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1922 *History of Santa Clara County, California*. Los Angeles: Historic Record Company.

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1876 *Historical Atlas of Santa Clara County*. Reprinted by Smith & McKay Printing Company, 1973.

Third District Court
1852 Case No. 462: B. Ceseña vs. Wm. Castro. (On file at San Jose Historical Museum)

Ukestad, Royanne
1995 Personal communication with G. A. Laffey, April 26, 1995.

U. S. District Court
Land Case ND147, Rancho Las Llegas. On file at Bancroft Library, Berkeley.

Waid, B. H.
1991 *My Inherited Destiny: Ten First Families of California.* Typescript. (On file at Gilroy Historical Museum)

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1898 Notice of Appropriation of Water by Lazard Lion. (On file at San Jose Historical Museum)

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Herrmann, F. A.
1920 Map of the Lion Ranch being the Lion Ranch Company's Subdivision of the Original Lion and Buckley Tract in the Rancho San Francisco de las Llagas. Recorded Map P:46-60.

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1885 Map of an addition to the subdivision of the James Murphy Tract. Recorded Map B:24.

1890 Official Map of Santa Clara County.

Jones, Robet Trent
1994 Championship Golf Facility at Lion's Gate, Morgan Hill, California. Designed by Robert Trent Jones II Golf Course Design Group. Dec. 1994.

McMillan, J. G.
1903 Official Map of Santa Clara County. (On file at Santa Clara County Surveyors Office)

1914 Official Map of Santa Clara County. (On file at County Surveyor's Office)

McMillan & McMillan
1929 Official Map of Santa Clara County. (On file at Santa Clara County Surveyors Office)

Nolte and Associates, Inc.
1994 Proposed Lion's Gate Golf Course Site in Relationship to Lion's Gate Residential Cluster (Job # 202-89-13).

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1978-15-54 Lazard Lion Estate.

Swickard, A.
1915 Proposed So. Santa Clara Co. Irrigation District. (On file at San Jose Historical Museum)

U. S. Geological Survey
1955 Gilroy Quadrangle (7.5 Minute Series). Photo revised 1981.

APPENDIX

Historic Resource Inventory Forms

PRIMARY RECORD

CALIFORNIA Department of Parks and Recreation
Office of Historic Preservation

Primary #
HRI #
Trinomial CA-SC-76
NRHP Status Code 6Z1

Page 1 of

Other Listings
Review Code Reviewer Date

P1. Resource Identifier: Hayes Ranch

P2. Location: County Santa Clara and (Address and /or UTM Coordinates. Attach Location Map as required)

a. Address: 1005 Highland Avenue
City San Martin Zip 95046

b. UTM: USGSQuad Gilroy 7.5' (7.5'/15') Date 1981 ; Zone 3 , 622150 mE/ 4103600 mN

c. Other Locational Data: (Enter parcel #, legal description, directions to resource, and / or other locational data if appropriate)
APN 770-20-004

P3. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

Known as the Hayes Ranch, this complex of buildings includes several residences, barns, and other farm buildings. The complex is located at the end of Highland Avenue at the mouth of a canyon known as Hayes Valley. A small tributary to Llagas Creek bisects the complex. The setting includes oaks and other large trees, a bridge over the creek, and landscaped areas around the residences. The barns have associated fencing, corrals, and mangers and cattle loading shoots.

A primary record has been completed for each of the major buildings in the complex. One Building record has been provided for the entire complex.

P4. Resources Present: [x] Building [ ] Structure [ ] Object [ ] Site [ ] Element of District [ ] District

P5. Photograph or Drawing (Photograph required for buildings, structures, and objects)

See attached

P6. Date Constructed/Age: [ ] Prehistoric [x] Historic [ ] Both
1890-1970

P7. Owner and Address:
Robert & Royanne Ukestad
1005 Highland Avenue
San Martin, CA 95046

P8. Recorded by: (Name, affiliation, and address)
Glory Anne Laffey
Archives & Architecture
353 Surber Drive
San Jose, CA 95123

P9. Date Recorded: 5/1995

P10. Type of Survey: [x] Intensive [ ] Reconnaissance [ ] Other
Describe:

P11. Report Citation: (Provide full citation or enter "none")
Laffey, G.A., Historical and Architectural Evaluation for the Proposed Lion's Gate Golf Course. Report prepared by Archives & Architecture for Hix Rubenstein Companies, May 1995.

Attachments: [ ] NONE [ ] Location Map [ ] Continuation Sheet [x] Building, Structure, and Object Record [ ] Linear Resource Record [ ] Archaeological Record [ ] District Record [ ] Milling Station Record [ ] Rock Art Record [ ] Artifact Record [ ] Photograph Record [x] Other: (List) primary records for associated buildings

BUILDING, STRUCTURE, AND OBJECT RECORD

CALIFORNIA Department of Parks and Recreation
Office of Historic Preservation

Resource Identifier: Hayes Ranch
Primary # 1-6, 10-19
HRI #/Trinomial CA-SCl-76

B1. Address: 930/1005 Highland Avenue
City: San Martin County: Santa Clara Zip: 95046
B2. Historic Name: Hayes Ranch B3. Common Name:
B4. Zoning: B5. Threats: Development
B6. Architectural Style: Vernacular
B7. Alterations and Date(s):

B8. Moved? [ ] No [ ] Yes [x] Unknown Date: Original Location:
B9. Related Features:
A complex of residences, barns, creamery, sheds, feed mangers, and corrals.

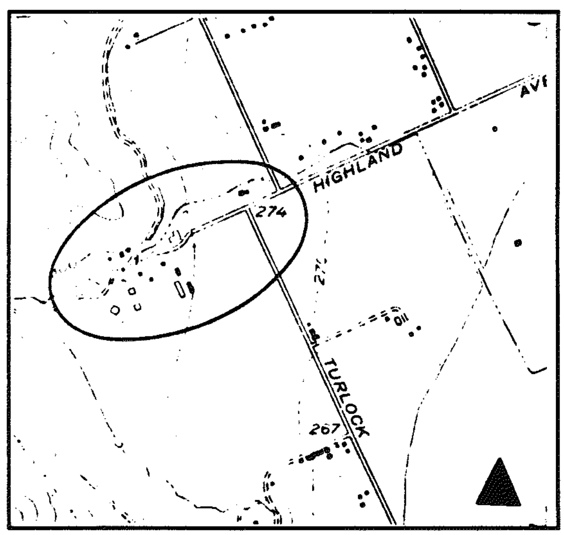
B10. Architect: unknown Builder: unknown
B11. Historic Attributes: (List attributes and codes) 33--cattle ranch, orchard, dairy farm
B12. Significance: Theme Agriculture Area Southern Santa Clara Valley
Period of Significance 1890-1950 Property Type ranch complex Applicable Criteria N/A
(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

Cattle ranching was the primary economic activity in the Santa Clara Valley from the 1830s until about the 1870s. Wheat and grain became basic crops during the 1850-1880 period to be replaced by fruit production during the 1890s. Cattle ranching continued as a important economic activity in the southern part of the valley, especially in the foothill areas, well into the twentieth century. In the late decades of the 19th century, valley acreage of the large ranches were broken up into smaller ranches and farms of several hundred acres. As horticulture became more popular, properties were further subdivided for family orchards. The property subdivision and land use of the Hayes Valley property was typical of land use patterns in the valley. There were no significant events were identified that associated this property with broad agricultural or land use patterns. Lazard Lion was an early and prominent merchant in San Jose and the Lions were in business in San Jose for over 100 years. Although members of the Lion family were involved in many of the 19th century developments in the City of San Jose, their contributions cannot be directly related to the Hayes Valley property. Frank and Carroll Hayes were also prominent cattlemen in Santa Clara County from 1918-1950. Carroll was the founder and first president of the Santa Clara County Cattlemen's Association. These activities, however, do not have sufficient significance to satisfy criterion B. None of the buildings represent distinctive architectural types, periods, of methods of construction as per criterion C.

B13. Evaluator: Glory Anne Laffey
B14. Date of Evaluation: May 1995
B15. Sources:

J. Broek, *Santa Clara Valley, California: A Study in Landscape Changes*, 1932.
E. Sawyer, *History of Santa Clara County*, 1922.
Gilroy Dispatch, Obituary for Carroll Hayes, 25 May 1983.
Arch Hayes, Personal Communication, May 1995.

(This space reserved for official comments)



PRIMARY RECORD

CALIFORNIA Department of Parks and Recreation
Office of Historic Preservation

Primary # 1
HRI #
Trinomial CA-SC-76
NRHP Status Code 6Z1

Page 3 of

Other Listings
Review Code Reviewer Date

P1. Resource Identifier: Hayes Ranch (Yellow House)

P2. Location: County Santa Clara and (Address and /or UTM Coordinates. Attach Location Map as required)

a. Address: 1005 Highland Avenue

City San Martin Zip 95046

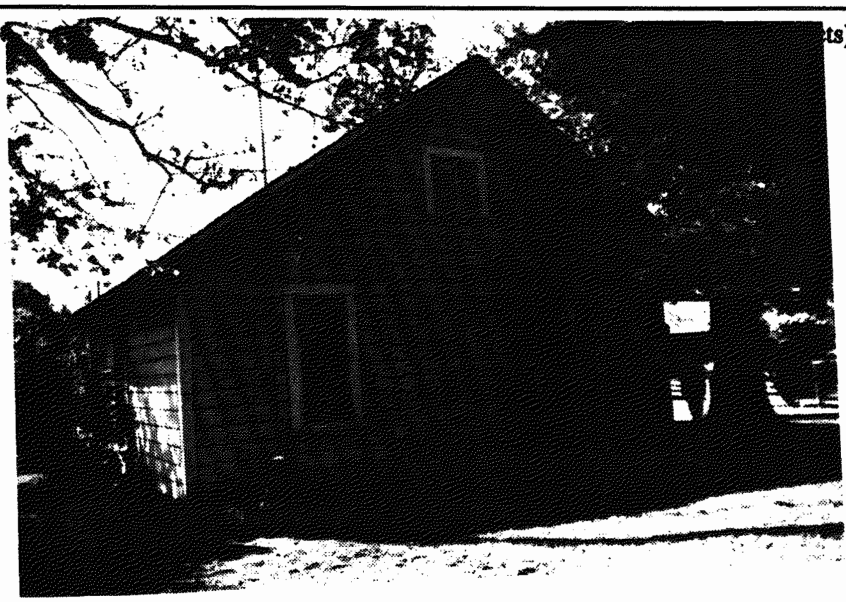
b. UTM: USGSQuad Gilroy 7.5' (7.5'/15') Date 1981 ; Zone 3 , 622450 mE/ 4103050 mN

c. Other Locational Data: (Enter parcel #, legal description, directions to resource, and / or other locational data if appropriate)
APN 770-20-004

P3. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)
This residence is a one story, front gabled, rectangular structure with channel rustic siding and corner boards. The roof has asphalt shingles and open, overhanging eaves with exposed purlins and rafter ends. There are shuttered attic vents in the peak of the gables. Fenestration includes vertical two-over-two paned windows with double hung sashes. A recent modification includes a horizontal window on the rear elevation. Entrances are located on the front, side and rear of the building. The front entrance is off-center. All windows and doors have plain surrounds. A chimney is located on the eave wall and appears to be an addition. A small enclosed porch with a shed roof is located on the southwest corner of the building. This building appears to date from the 1890s and can be seen in the 1901 photograph of the Lion Ranch. The siding and window types are consistent with a circa 1890 construction date. The roof was probably rebuilt during the early 20th century.

P4. Resources Present: [x] Building [ ] Structure [ ] Object [ ] Site [ ] Element of District [ ] District

P5. Pho... ts)



P6. Date Constructed/Age: [ ] Prehistoric [x] Historic [ ] Both
1890

P7. Owner and Address:
Robert & Royanne Ukestad
1005 Highland Avenue
San Martin, CA 95046

P8. Recorded by: (Name, affiliation, and address)
Glory Anne Laffey
Archives & Architecture
353 Surber Drive
San Jose, CA 95123

P9. Date Recorded: 5/1995

P10. Type of Survey: [x] Intensive [ ] Reconnaissance [ ] Other
Describe:

P11. Report Citation: (Provide full citation or enter "none")
Laffey, G.A., Historical and Architectural Evaluation for the Proposed Lion's Gate Golf Course. Report prepared by Archives & Architecture for Hix Rubenstein Companies, May 1995.

Attachments: [ ] NONE [ ] Location Map [ ] Continuation Sheet [ ] Building, Structure, and Object Record [ ] Linear Resource Record [ ] Archaeological Record [ ] District Record [ ] Milling Station Record [ ] Rock Art Record [ ] Artifact Record [ ] Photograph Record [ ] Other: (List)

DPR 523A-Test (10/93)

PRIMARY RECORD

CALIFORNIA Department of Parks and Recreation
Office of Historic Preservation

Primary # 2
HRI #
Trinomial CA-SC-76
NRHP Status Code 6Z1

Other Listings
Review Code Reviewer Date

P1. Resource Identifier: Hayes Ranch (Shed)

P2. Location: County Santa Clara and (Address and /or UTM Coordinates. Attach Location Map as required)

a. Address: 1005 Highland Avenue
City San Martin Zip 95046

b. UTM: USGSQuad Gilroy 7.5' (7.5'/15') Date 1981 ; Zone 3 , 622450 mE/ 4103050 mN

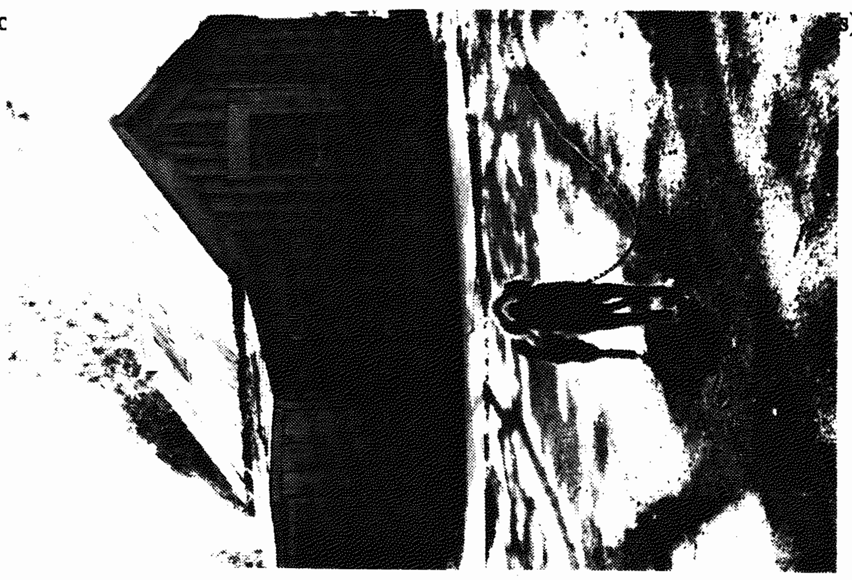
c. Other Locational Data: (Enter parcel #, legal description, directions to resource, and / or other locational data if appropriate)
APN 770-20-004

P3. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

This small building features a front gabled roof with enclosed eaves. The building is clad with board-and-batten siding with frieze board in the rake of the gable. Windows are small with fixed panes. An addition with a low-pitched shed roof and vertical siding is attached to the north side.

P4. Resources Present: [x] Building [ ] Structure [ ] Object [ ] Site [ ] Element of District [ ] District

P5. Phc)



P6. Date Constructed/Age: [ ] Prehistoric [x] Historic [ ] Both
1890

P7. Owner and Address:
Robert & Royanne Ukestad
1005 Highland Avenue
San Martin, CA 95046

P8. Recorded by: (Name, affiliation, and address)
Glory Anne Laffey
Archives & Architecture
353 Surber Drive
San Jose, CA 95123

P9. Date Recorded: 5/1995

P10. Type of Survey: [x] Intensive [ ] Reconnaissance [ ] Other
Describe:

P11. Report Citation: (Provide full citation or enter "none")
Laffey, G.A., Historical and Architectural Evaluation for the Proposed Lion's Gate Golf Course. Report prepared by Archives & Architecture for Hix Rubenstein Companies, May 1995.

Attachments: [ ] NONE [ ] Location Map [ ] Continuation Sheet [ ] Building, Structure, and Object Record [ ] Linear Resource Record [ ] Archaeological Record [ ] District Record [ ] Milling Station Record [ ] Rock Art Record [ ] Artifact Record [ ] Photograph Record
[ ] Other: (List)

PRIMARY RECORD

CALIFORNIA Department of Parks and Recreation
Office of Historic Preservation

Primary # 3
HRI #
Trinomial CA-SC-76
NRHP Status Code 6Z1

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Other Listings
Review Code Reviewer Date

P1. Resource Identifier: Hayes Ranch (barn)

P2. Location: County Santa Clara and (Address and /or UTM Coordinates. Attach Location Map as required)

a. Address: 1005 Highland Avenue

City San Martin Zip 95046

b. UTM: USGSQuad Gilroy 7.5' (7.5'/15') Date 1981 ; Zone 3 , 622450 mE/ 4103000 mN

c. Other Locational Data: (Enter parcel #, legal description, directions to resource, and / or other locational data if appropriate)

APN 770-20-004

P3. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)
One of several barns on the property, this large, long building features a double gable with raised ridge vents. The roof is covered with a corrugated metal sheets. The overhanging eaves are unenclosed with exposed rafters. Some portions of the barn are clad with board-and-batten siding; however, most of the building is clad with vertical boards. The floor is concrete.

P4. Resources Present: [x] Building [ ] Structure [ ] Object [ ] Site [ ] Element of District [ ] District

P5. P s)

P6. Date Constructed/Age:
[ ] Prehistoric [x] Historic [ ] Both
1900

P7. Owner and Address:
Robert & Royanne Ukestad
1005 Highland Avenue
San Martin, CA 95046

P8. Recorded by: (Name, affiliation, and address)
Glory Anne Laffey
Archives & Architecture
353 Surber Drive
San Jose, CA 95123

P9. Date Recorded: 5/1995

P10. Type of Survey: [x] Intensive
[ ] Reconnaissance [ ] Other
Describe:

P11. Report Citation: (Provide full citation or enter "none")
Laffey, G.A., Historical and Architectural Evaluation for the Proposed Lion's Gate Golf Course. Report prepared by Archives & Architecture for Hix Rubenstein Companies, May 1995.

Attachments: [ ] NONE [ ] Location Map [ ] Continuation Sheet [ ] Building, Structure, and Object Record [ ] Linear Resource Record [ ] Archaeological Record [ ] District Record [ ] Milling Station Record [ ] Rock Art Record [ ] Artifact Record [ ] Photograph Record
[ ] Other: (List)

DPR 523A-Test (10/93)

PRIMARY RECORD

CALIFORNIA Department of Parks and Recreation
Office of Historic Preservation

Primary # 4
HRI #
Trinomial CA-SC-76
NRHP Status Code 6Z1

Page 6 of

Other Listings
Review Code Reviewer Date

P1. Resource Identifier: Hayes Ranch (barn)

P2. Location: County Santa Clara and (Address and /or UTM Coordinates. Attach Location Map as required)

a. Address: 1005 Highland Avenue

City San Martin Zip 95046

b. UTM: USGSQuad Gilroy 7.5' (7.5'/15') Date 1981 ; Zone 3 , 622450 mE/ 4102900 mN

c. Other Locational Data: (Enter parcel #, legal description, directions to resource, and / or other locational data if appropriate)
APN 770-20-004

P3. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)
This barn has broad gables with open eaves. The roof is covered with corrugated metal sheets and the gable wall is clad with vertical boards that have been sawn with a circular saw. The eave sides are open and the roof is supported by bracketed posts. The barn is surrounded by a system of corrals. Corral fences have horizontal wood rails.

P4. Resources Present: [x] Building [ ] Structure [ ] Object [ ] Site [ ] Element of District [ ] District

P5. P :ts)

P6. Date Constructed/Age: [ ] Prehistoric [x] Historic [ ] Both
1920

P7. Owner and Address:
Robert & Royanne Ukestad
1005 Highland Avenue
San Martin, CA 95046

P8. Recorded by: (Name, affiliation, and address)
Glory Anne Laffey
Archives & Architecture
353 Surber Drive
San Jose, CA 95123

P9. Date Recorded: 5/1995

P10. Type of Survey: [x] Intensive [ ] Reconnaissance [ ] Other
Describe:

P11. Report Citation: (Provide full citation or enter "none")
Laffey, G.A., Historical and Architectural Evaluation for the Proposed Lion's Gate Golf Course. Report prepared by Archives & Architecture for Hix Rubenstein Companies, May 1995.

Attachments: [ ] NONE [ ] Location Map [ ] Continuation Sheet [ ] Building, Structure, and Object Record [ ] Linear Resource Record [ ] Archaeological Record [ ] District Record [ ] Milling Station Record [ ] Rock Art Record [ ] Artifact Record [ ] Photograph Record [ ] Other: (List)

PRIMARY RECORD
CALIFORNIA Department of Parks and Recreation
Office of Historic Preservation

Primary # 5
HRI #
Trinomial CA-SC-76
NRHP Status Code 6Z1

Page 7 of

Other Listings
Review Code Reviewer Date

P1. Resource Identifier: Hayes Ranch (barn)

P2. Location: County Santa Clara and (Address and /or UTM Coordinates. Attach Location Map as required)

a. Address: 1005 Highland Avenue

City San Martin Zip 95046

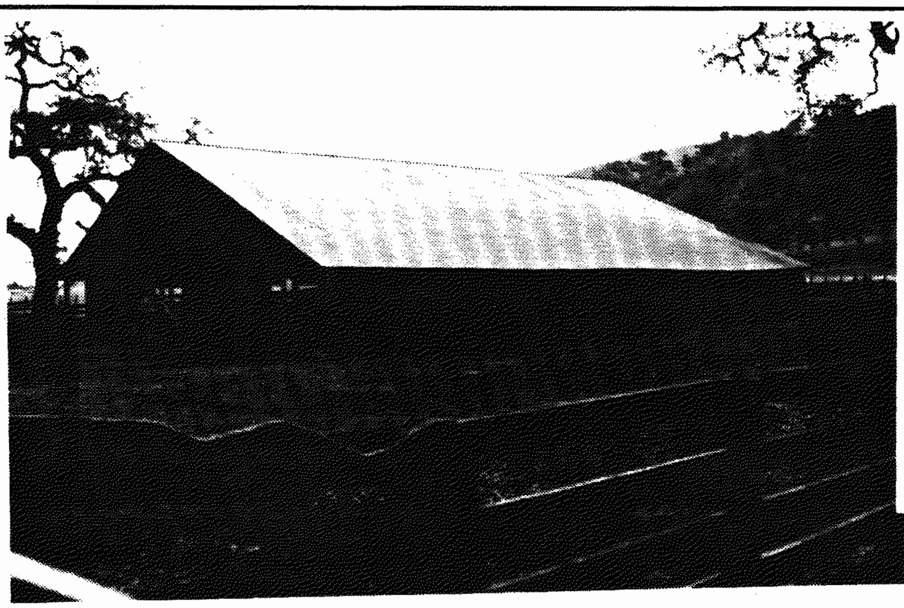
b. UTM: USGSQuad Gilroy 7.5' (7.5'/15') Date 1981 ; Zone 3 , 622400 mE/ 4102900 mN

c. Other Locational Data: (Enter parcel #, legal description, directions to resource, and / or other locational data if appropriate)
APN 770-20-004

P3. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)
This barn has broad gables with open eaves. The roof is covered with corrugated metal sheets and the gable wall is clad with vertical boards that have been sawn with a circular saw. The eave sides are open and the roof is supported by bracketed posts. The barn is surrounded by a system of corrals. Corral fences have horizontal wood rails.
There also a cattle loading shoot.

P4. Resources Present: [x] Building [ ] Structure [ ] Object [ ] Site [ ] Element of District [ ] District

P5.



P6. Date Constructed/Age:
[ ] Prehistoric [x] Historic [ ] Both
1914

P7. Owner and Address:
Robert & Royanne Ukestad
1005 Highland Avenue
San Martin, CA 95046

P8. Recorded by: (Name, affiliation, and address)
Glory Anne Laffey
Archives & Architecture
353 Surber Drive
San Jose, CA 95123

P9. Date Recorded: 5/1995

P10. Type of Survey: [x] Intensive [ ] Reconnaissance [ ] Other
Describe:

P11. Report Citation: (Provide full citation or enter "none")
Laffey, G.A., Historical and Architectural Evaluation for the Proposed Lion's Gate Golf Course. Report prepared by Archives & Architecture for Hix Rubenstein Companies, May 1995.

Attachments: [ ] NONE [ ] Location Map [ ] Continuation Sheet [x] Building, Structure, and Object Record [ ] Linear Resource Record [ ] Archaeological Record [ ] District Record [ ] Milling Station Record [ ] Rock Art Record [ ] Artifact Record [ ] Photograph Record [ ] Other: (List)

PRIMARY RECORD
CALIFORNIA Department of Parks and Recreation
Office of Historic Preservation

Primary # 6
HRI #
Trinomial CA-SC-76
NRHP Status Code 6Z1

Page 8 of

Other Listings
Review Code Reviewer Date

P1. Resource Identifier: Hayes Ranch

P2. Location: County Santa Clara and (Address and /or UTM Coordinates. Attach Location Map as required)

a. Address: 1005 Highland Avenue

City San Martin Zip 95046

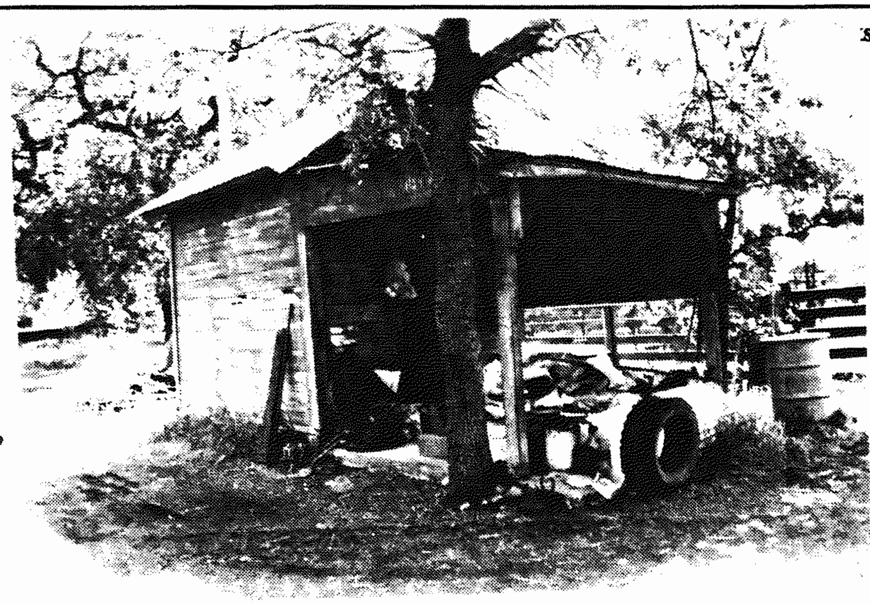
b. UTM: USGSQuad Gilroy 7.5' (7.5'/15') Date 1981 ; Zone 3 , 622400 mE/ 4103000 mN

c. Other Locational Data: (Enter parcel #, legal description, directions to resource, and / or other locational data if appropriate)
APN 770-20-004

P3. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)
This small gabled shed has an open porch on the gable end. The roof is covered with corrugated metal sheets. The overhanding eaves are enclosed with a fasia board. The building in clad with flush horizontal siding with corner boards. A small window is unglazed. A scar on the eave wall indicates that an entrance has been closed off. The entrance on the gable end has a paneled door. The shed-roofed, open work area on the west end of the building has a concrete floor.

P4. Resources Present: [x] Building [ ] Structure [ ] Object [ ] Site [ ] Element of District [ ] District

P5.] s)



P6. Date Constructed/Age:
[ ] Prehistoric [x] Historic [ ] Both
1910

P7. Owner and Address:
Robert & Royanne Ukestad
1005 Highland Avenue
San Martin, CA 95046

P8. Recorded by: (Name, affiliation, and address)
Glory Anne Laffey
Archives & Architecture
353 Surber Drive
San Jose, CA 95123

P9. Date Recorded: 5/1995

P10. Type of Survey: [x] Intensive
[ ] Reconnaissance [ ] Other
Describe:

P11. Report Citation: (Provide full citation or enter "none")
Laffey, G.A., Historical and Architectural Evaluation for the Proposed Lion's Gate Golf Course. Report prepared by Archives & Architecture for Hix Rubenstein Companies, May 1995.

Attachments: [ ] NONE [ ] Location Map [ ] Continuation Sheet [ ] Building, Structure, and Object Record [ ] Linear Resource Record [ ] Archaeological Record [ ] District Record [ ] Milling Station Record [ ] Rock Art Record [ ] Artifact Record [ ] Photograph Record [ ] Other: (List)

PRIMARY RECORD

CALIFORNIA Department of Parks and Recreation
Office of Historic Preservation

Primary # 10
HRI #
Trinomial CA-SC-76
NRHP Status Code 6Z1

Page 9 of

Other Listings
Review Code Reviewer Date

P1. Resource Identifier: Hayes Ranch (barn)

P2. Location: County Santa Clara and (Address and /or UTM Coordinates. Attach Location Map as required)

a. Address: 1005 Highland Avenue

City San Martin Zip 95046

b. UTM: USGSQuad Gilroy 7.5' (7.5'/15') Date 1981 ; Zone 3 , 622500 mE/ 4103150 mN

c. Other Locational Data: (Enter parcel #, legal description, directions to resource, and / or other locational data if appropriate)

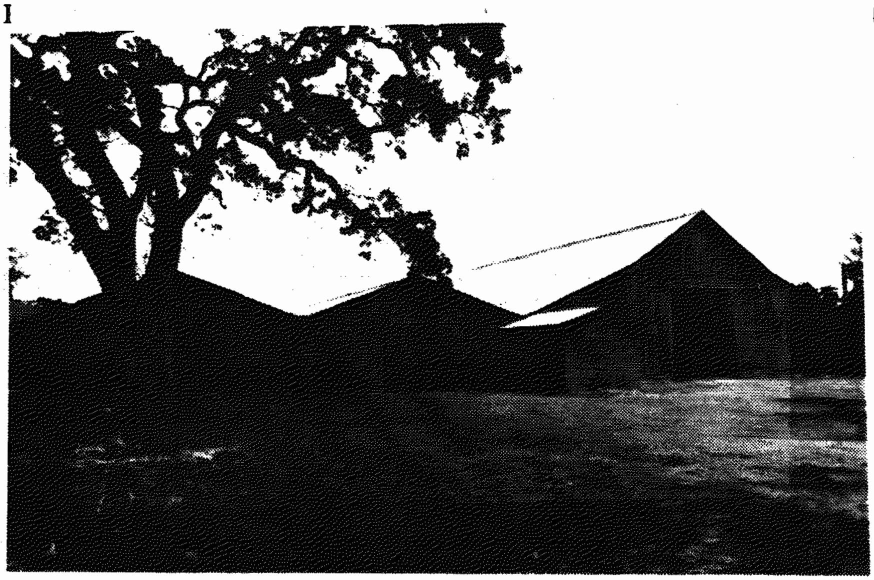
APN 770-20-004

P3. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

This barn is located on Highland Avenue near the entrance to the main building complex. This building consists of one large section and two smaller sections, all with gables that face the road. The larger section has a dual pitched roof covered with corrugated metal sheeting. There are no gable rakes on any of the sections. The buildings are clad with vertical boards. The upper portion of the gable on the larger section has battens. Doors on the barns slide in metal channels. The east wall of the building is open with half-walls. The barn sits on a formed concrete foundation. Attached to the eastern side of the building is a cattle loading shoot, and corrals are located at the sides and rear of the struc□ture.

P4. Resources Present: [x] Building [ ] Structure [ ] Object [ ] Site [ ] Element of District [ ] District

P5. I ts)



P6. Date Constructed/Age: [ ] Prehistoric [x] Historic [ ] Both

1915

P7. Owner and Address:

Robert & Royanne Ukestad
1005 Highland Avenue
San Martin, CA 95046

P8. Recorded by: (Name, affiliation, and address)

Glory Anne Laffey
Archives & Architecture
353 Surber Drive
San Jose, CA 95123

P9. Date Recorded: 5/1995

P10. Type of Survey: [x] Intensive [ ] Reconnaissance [ ] Other

Describe:

P11. Report Citation: (Provide full citation or enter "none")

Laffey, G.A., Historical and Architectural Evaluation for the Proposed Lion's Gate Golf Course. Report prepared by Archives & Architecture for Hix Rubenstein Companies, May 1995.

Attachments: [ ] NONE [ ] Location Map [ ] Continuation Sheet [ ] Building, Structure, and Object Record [ ] Linear Resource Record [ ] Archaeological Record [ ] District Record [ ] Milling Station Record [ ] Rock Art Record [ ] Artifact Record [ ] Photograph Record [ ] Other: (List)

PRIMARY RECORD

CALIFORNIA Department of Parks and Recreation
Office of Historic Preservation

Primary # 11
HRI #
Trinomial CA-SC-76
NRHP Status Code 6Z1

Page 10 of

Other Listings
Review Code Reviewer Date

P1. Resource Identifier: Hayes Ranch (dairy barn)

P2. Location: County Santa Clara and (Address and /or UTM Coordinates. Attach Location Map as required)

a. Address: 930 Highland Avenue
City San Martin Zip 95046

b. UTM: USGSQuad Gilroy 7.5' (7.5'/15') Date 1981 ; Zone 3 , 622650 mE/ 4103000 mN

c. Other Locational Data: (Enter parcel #, legal description, directions to resource, and / or other locational data if appropriate)
APN 779-21-023

P3. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)
This structure appears to be large dairy barn. It has a broad low-pitched roof with a raised ridge vent. The roof is covered with corrugated metal sheets. The sides are open and the building is surrounded by corrals.

P4. Resources Present: [x] Building [ ] Structure [ ] Object [ ] Site [ ] Element of District [ ] District

P5. Phc ›cts)

P6. Date Constructed/Age:
[ ] Prehistoric [x] Historic [ ] Both
1920

P7. Owner and Address:
IBM Corporation
Old Orchard Road
Armonk, NY 10504

P8. Recorded by: (Name, affiliation, and address)
Glory Anne Laffey
Archives & Architecture
353 Surber Drive
San Jose, CA 95123

P9. Date Recorded: 5/1995

P10. Type of Survey: [x] Intensive [ ] Reconnaissance [ ] Other
Describe:

P11. Report Citation: (Provide full citation or enter "none")
Laffey, G.A., Historical and Architectural Evaluation for the Proposed Lion's Gate Golf Course. Report prepared by Archives & Architecture for Hix Rubenstein Companies, May 1995.

Attachments: [ ] NONE [ ] Location Map [ ] Continuation Sheet [ ] Building, Structure, and Object Record [ ] Linear Resource Record [ ] Archaeological Record [ ] District Record [ ] Milling Station Record [ ] Rock Art Record [ ] Artifact Record [ ] Photograph Record [ ] Other: (List)

PRIMARY RECORD

CALIFORNIA Department of Parks and Recreation
Office of Historic Preservation

Primary # 12
HRI #
Trinomial CA-SC-76
NRHP Status Code 6Z1

Page 11 of

Other Listings
Review Code Reviewer Date

P1. Resource Identifier: Hayes Ranch (creamery)

P2. Location: County Santa Clara and (Address and /or UTM Coordinates. Attach Location Map as required)

a. Address: 930 Highland Avenue
City San Martin Zip 95046

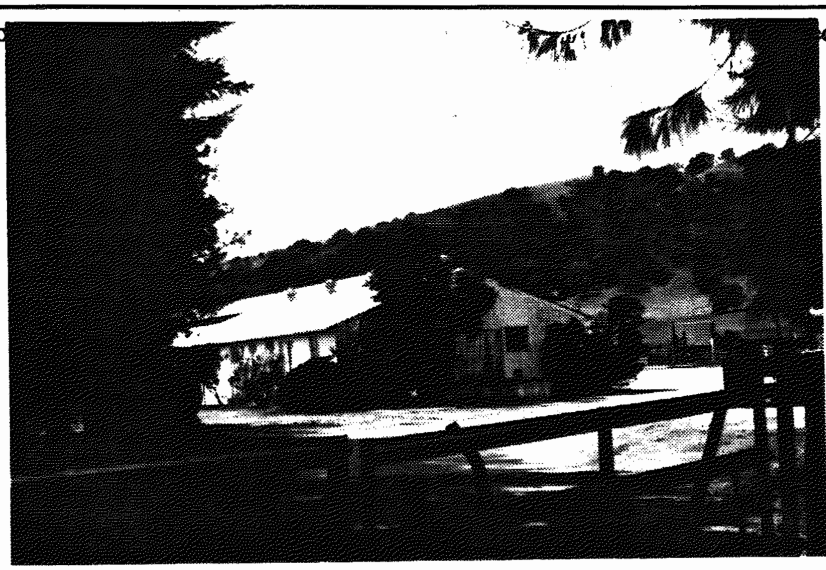
b. UTM: USGSQuad Gilroy 7.5' (7.5'/15') Date 1981 ; Zone 3 , 622800 mE/ 4103200 mN

c. Other Locational Data: (Enter parcel #, legal description, directions to resource, and / or other locational data if appropriate)
APN 779-21-023

P3. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)
This building has a low-pitched gabled roof. The roof has overhanging eave and a close rake. The roof is covered with corrugated metal sheeting punctuated by small rotating vents. The building is clad with stucco or plaster siding. Fenestration included metal framed casement windows. There is a raised loading dock on the north end of the structure.

P4. Resources Present: [x] Building [ ] Structure [ ] Object [ ] Site [ ] Element of District [ ] District

P5. Pho... cts)



P6. Date Constructed/Age:
[ ] Prehistoric [x] Historic [ ] Both
1920

P7. Owner and Address:
IBM Corporation
Old Orchard Road
Armonk, NY 10504

P8. Recorded by: (Name, affiliation, and address)
Glory Anne Laffey
Archives & Architecture
353 Surber Drive
San Jose, CA 95123

P9. Date Recorded: 5/1995

P10. Type of Survey: [x] Intensive [ ] Reconnaissance [ ] Other
Describe:

P11. Report Citation: (Provide full citation or enter "none")
Laffey, G.A., Historical and Architectural Evaluation for the Proposed Lion's Gate Golf Course. Report prepared by Archives & Architecture for Hix Rubenstein Companies, May 1995.

Attachments: [ ] NONE [ ] Location Map [ ] Continuation Sheet [ ] Building, Structure, and Object Record [ ] Linear Resource Record [ ] Archaeological Record [ ] District Record [ ] Milling Station Record [ ] Rock Art Record [ ] Artifact Record [ ] Photograph Record [ ] Other: (List)

PRIMARY RECORD
CALIFORNIA Department of Parks and Recreation
Office of Historic Preservation

Primary # 13
HRI #
Trinomial CA-SC-76
NRHP Status Code 6Z1

Page 12 of

Other Listings
Review Code Reviewer Date

P1. Resource Identifier: Hayes Ranch (white house)

P2. Location: County Santa Clara and (Address and /or UTM Coordinates. Attach Location Map as required)

a. Address: 930 Highland Avenue

City San Martin Zip 95046

b. UTM: USGSQuad Gilroy 7.5' (7.5'/15') Date 1981 ; Zone 3 , 622600 mE/ 4103100 mN

c. Other Locational Data: (Enter parcel #, legal description, directions to resource, and / or other locational data if appropriate)
APN 779-21-023

P3. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

The residence is a one-story bungalow with a low-pitched hipped roof and an integrated porch. The wide over-hanging eaves have exposed rafter tails. The building is sheathed with trilap (or false beveled) bungalow siding. The front porch is enclosed forming a sun room. With the exception of the porch, fenestration included one-over-one double-hung sash windows with wood frames. The building appears to be in good condition. It is surrounded by a large, well-maintained, fenced yard that includes lawn and mature palm, redwood, and eucalyptus trees.

P4. Resources Present: [x] Building [ ] Structure [ ] Object [ ] Site [ ] Element of District [ ] District

P5. Photograph or Drawing (Photograph required for buildings, structures, and objects)

P6. Date Constructed/Age: [ ] Prehistoric [x] Historic [ ] Both
1920

P7. Owner and Address:
IBM Corporation
Old Orchard Road
Armonk, NY 10504

P8. Recorded by: (Name, affiliation, and address)
Glory Anne Laffey
Archives & Architecture
353 Surber Drive
San Jose, CA 95123

P9. Date Recorded: 5/1995

P10. Type of Survey: [x] Intensive [ ] Reconnaissance [ ] Other
Describe:

P11. Report Citation: (Provide full citation or enter "none")
Laffey, G.A., Historical and Architectural Evaluation for the Proposed Lion's Gate Golf Course. Report prepared by Archives & Architecture for Hix Rubenstein Companies, May 1995.

Attachments: [ ] NONE [ ] Location Map [ ] Continuation Sheet [ ] Building, Structure, and Object Record [ ] Linear Resource Record [ ] Archaeological Record [ ] District Record [ ] Milling Station Record [ ] Rock Art Record [ ] Artifact Record [ ] Photograph Record [ ] Other: (List)

PRIMARY RECORD

CALIFORNIA Department of Parks and Recreation
Office of Historic Preservation

Primary # 14
HRI #
Trinomial CA-SC-76
NRHP Status Code 6Z1

Page 13 of

Other Listings
Review Code Reviewer Date

P1. Resource Identifier: Hayes Ranch (white shed)

P2. Location: County Santa Clara and (Address and /or UTM Coordinates. Attach Location Map as required)

a. Address: 930 Highland Avenue
City San Martin Zip 95046

b. UTM: USGSQuad Gilroy 7.5' (7.5'/15') Date 1981 ; Zone 3 , 622600 mE/ 4103000 mN

c. Other Locational Data: (Enter parcel #, legal description, directions to resource, and / or other locational data if appropriate)
APN 779-21-023

P3. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

This building is a long one-story building with a gable roof. There is a one-and-a-half story section at one end. The roof is covered with corrugated metal sheets. The gable rake is close, and the eaves overhang slightly with exposed rafter tails. The building has a concrete foundation and is sheathed with vertical boards.

P4. Resources Present: [x] Building [ ] Structure [ ] Object [ ] Site [ ] Element of District [ ] District

P5. ts)

P6. Date Constructed/Age: [ ] Prehistoric [x] Historic [ ] Both
1960

P7. Owner and Address:
IBM Corporation
Old Orchard Road
Armonk, NY 10504

P8. Recorded by: (Name, affiliation, and address)
Glory Anne Laffey
Archives & Architecture
353 Surber Drive
San Jose, CA 95123

P9. Date Recorded: 5/1995

P10. Type of Survey: [x] Intensive [ ] Reconnaissance [ ] Other
Describe:

P11. Report Citation: (Provide full citation or enter "none")
Laffey, G.A., Historical and Architectural Evaluation for the Proposed Lion's Gate Golf Course. Report prepared by Archives & Architecture for Hix Rubenstein Companies, May 1995.

Attachments: [ ] NONE [ ] Location Map [ ] Continuation Sheet [ ] Building, Structure, and Object Record [ ] Linear Resource Record [ ] Archaeological Record [ ] District Record [ ] Milling Station Record [ ] Rock Art Record [ ] Artifact Record [ ] Photograph Record [ ] Other: (List)

DPR 523A-Test (10/93)

PRIMARY RECORD

CALIFORNIA Department of Parks and Recreation
Office of Historic Preservation

Primary # 15
HRI #
Trinomial CA-SC-76
NRHP Status Code 6Z1

Other Listings
Review Code Reviewer Date

P1. Resource Identifier: Hayes Ranch (residence)

P2. Location: County Santa Clara and (Address and /or UTM Coordinates. Attach Location Map as required)

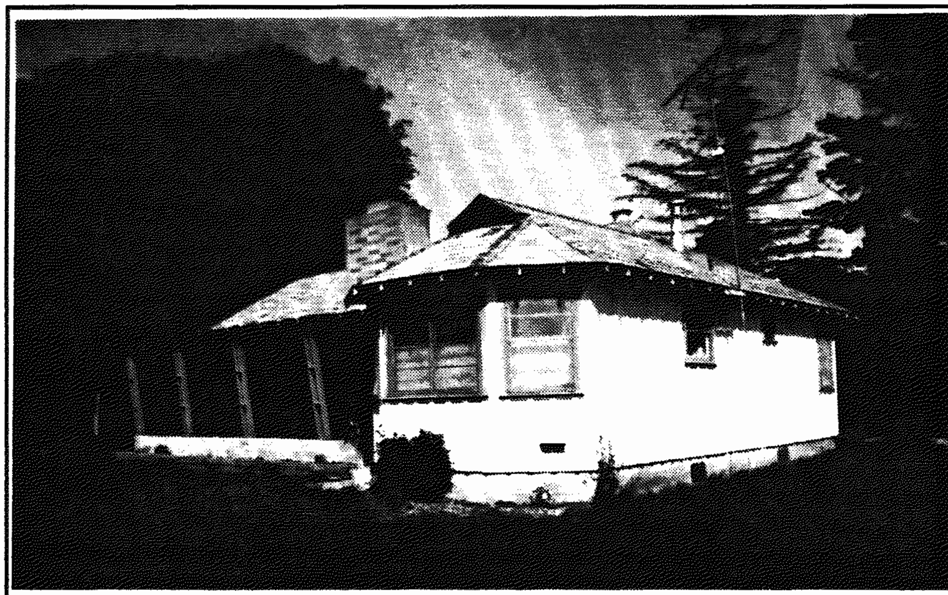
a. Address: 1005 Highland Avenue
City San Martin Zip 95046

b. UTM: USGSQuad Gilroy 7.5' (7.5'/15') Date 1981 ; Zone 3 , 622800 mE/ 4103300 mN

c. Other Locational Data: (Enter parcel #, legal description, directions to resource, and / or other locational data if appropriate)
APN 770-20-004

P3. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)
This residence is located on Highland Avenue near the Turlock intersection. The house was constructed in two phases resulting in a cross gabled roof line. One building phase consisted of a simple rectangular bungalow with a side-gabled roof. The over-hanging eaves have exposed rafters and the gable has triangular eave braces. This section of the building is sheathed with trilap or false bevel bungalow siding. A large chimney was added to the front of this section. At right angles to this section is a wing with gable-on-hip roof. The front of the wing has a slanted bay. This section has been sheathed with plywood-and-batten siding. Fenestration consists of double-hung wood frame sash windows. Each sash is divided horizontally. A porch has been added across the front of the house in the ell of the wing. It has a shed roof and is supported by double posts that are canted at an angle. This building is surrounded by a wide expanse of lawn. Associated with this building a raised water tank and a barn (#16). The water tank is constructed of redwood staves with iron rings. The supporting frame was obscured by dense vegetation.

P4. Resources Present: [x] Building [ ] Structure [ ] Object [ ] Site [ ] Element of District [ ] District



P6. Date Constructed/Age:
[ ] Prehistoric [x] Historic [ ] Both
1920

P7. Owner and Address:
Robert & Royanne Ukestad
1005 Highland Avenue
San Martin, CA 95046

P8. Recorded by: (Name, affiliation, and address)
Glory Anne Laffey
Archives & Architecture
353 Surber Drive
San Jose, CA 95123

P9. Date Recorded: 5/1995

P10. Type of Survey: [x] Intensive [ ] Reconnaissance [ ] Other
Describe:

P11. Report Citation: (Provide full citation or enter "none")
Laffey, G.A., Historical and Architectural Evaluation for the Proposed Lion's Gate Golf Course. Report prepared by Archives & Architecture for Hix Rubenstein Companies, May 1995.

Attachments: [ ] NONE [ ] Location Map [ ] Continuation Sheet [ ] Building, Structure, and Object Record [ ] Linear Resource Record [ ] Archaeological Record [ ] District Record [ ] Milling Station Record [ ] Rock Art Record [ ] Artifact Record [ ] Photograph Record [ ] Other: (List)

PRIMARY RECORD
CALIFORNIA Department of Parks and Recreation
Office of Historic Preservation

Primary # 16
HRI #
Trinomial CA-SC-76
NRHP Status Code 6Z1

Page 15 of

Other Listings
Review Code Reviewer Date

P1. Resource Identifier: Hayes Ranch (barn)

P2. Location: County Santa Clara and (Address and /or UTM Coordinates. Attach Location Map as required)

a. Address: 1005 Highland Avenue
City San Martin Zip 95046

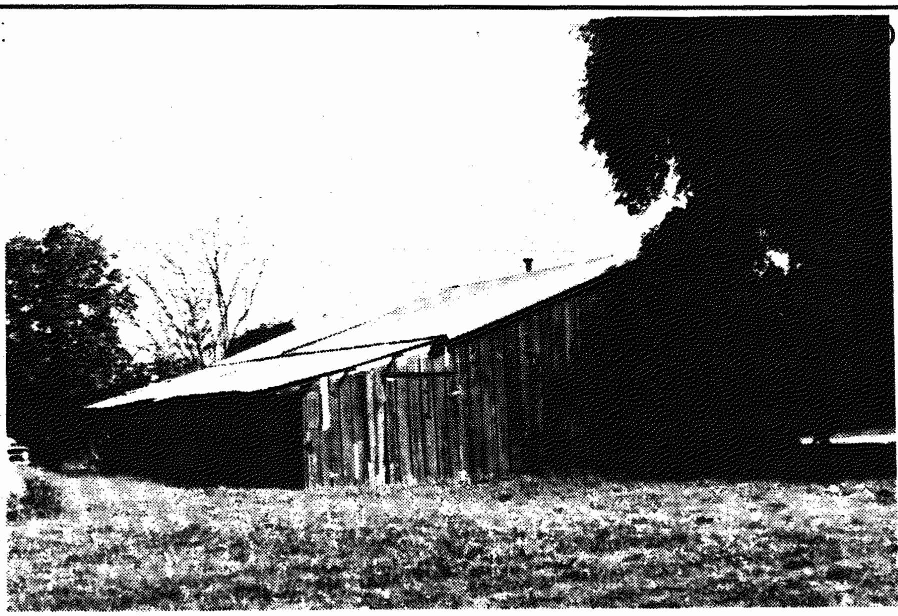
b. UTM: USGSQuad Gilroy 7.5' (7.5'/15') Date 1981 ; Zone 3 , 622800 mE/ 4103300 mN

c. Other Locational Data: (Enter parcel #, legal description, directions to resource, and / or other locational data if appropriate)
APN 770-20-004

P3. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)
Associated with Residence #15, this one-story barn has a gable roof with overhanging eaves. The roof is covered with corrugated metal sheets and the building is clad with vertical boards and board-and-batten siding. The addition on the west elevation has a shed roof.

P4. Resources Present: [x] Building [ ] Structure [ ] Object [ ] Site [ ] Element of District [ ] District

P5.



P6. Date Constructed/Age: [ ] Prehistoric [x] Historic [ ] Both
1960

P7. Owner and Address:
Robert & Royanne Ukestad
1005 Highland Avenue
San Martin, CA 95046

P8. Recorded by: (Name, affiliation, and address)
Glory Anne Laffey
Archives & Architecture
353 Surber Drive
San Jose, CA 95123

P9. Date Recorded: 5/1995

P10. Type of Survey: [x] Intensive [ ] Reconnaissance [ ] Other
Describe:

P11. Report Citation: (Provide full citation or enter "none")
Laffey, G.A., Historical and Architectural Evaluation for the Proposed Lion's Gate Golf Course. Report prepared by Archives & Architecture for Hix Rubenstein Companies, May 1995.

Attachments: [ ] NONE [ ] Location Map [ ] Continuation Sheet [ ] Building, Structure, and Object Record [ ] Linear Resource Record [ ] Archaeological Record [ ] District Record [ ] Milling Station Record [ ] Rock Art Record [ ] Artifact Record [ ] Photograph Record [ ] Other: (List)

DPR 523A-Test (10/93)

PRIMARY RECORD

CALIFORNIA Department of Parks and Recreation
Office of Historic Preservation

Primary # 17
HRI #
Trinomial CA-SC-76
NRHP Status Code 6Z1

Page 16 of
Other Listings
Review Code Reviewer Date

P1. Resource Identifier: Hayes Ranch (Ukestad Residence)

P2. Location: County Santa Clara and (Address and /or UTM Coordinates. Attach Location Map as required)

a. Address: 1005 Highland Avenue
City San Martin Zip 95046

b. UTM: USGSQuad Gilroy 7.5' (7.5'/15') Date 1981 ; Zone 3 , 622100 mE/ 4103100 mN

c. Other Locational Data: (Enter parcel #, legal description, directions to resource, and / or other locational data if appropriate)
APN 770-20-004

P3. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)
This house is a basic side-gabled rectangular vernacular style with a two-story addition on the eastern end. The building is constructed on the side of a hill and has a raised foundation and porch. The older section of the house has overhanging eaves with exposed rafter tails. The wrap-around porch has an open balustrade and a shed roof supported by braced posts. A bay window has been added to the northwest corner. The two-story addition has plywood siding. The addition has a two-story slanted bay window and a balcony. All the fenestration consists of metal frame windows.

P4. Resources Present: [x] Building [ ] Structure [ ] Object [ ] Site [ ] Element of District [ ] District

P6. Date Constructed/Age:
[ ] Prehistoric [x] Historic [ ] Both
1920

P7. Owner and Address:
Robert & Royanne Ukestad
1005 Highland Avenue
San Martin, CA 95046

P8. Recorded by: (Name, affiliation, and address)
Glory Anne Laffey
Archives & Architecture
353 Surber Drive
San Jose, CA 95123

P9. Date Recorded: 5/1995

P10. Type of Survey: [x] Intensive
[ ] Reconnaissance [ ] Other
Describe:

P11. Report Citation: (Provide full citation or enter "none")
Laffey, G.A., Historical and Architectural Evaluation for the Proposed Lion's Gate Golf Course. Report prepared by Archives & Architecture for Hix Rubenstein Companies, May 1995.

Attachments: [ ] NONE [ ] Location Map [ ] Continuation Sheet [ ] Building, Structure, and Object Record [ ] Linear Resource Record [ ] Archaeological Record [ ] District Record [ ] Milling Station Record [ ] Rock Art Record [ ] Artifact Record [ ] Photograph Record
[ ] Other: (List)

DPR 523A-Test (10/93)

PRIMARY RECORD

CALIFORNIA Department of Parks and Recreation
Office of Historic Preservation

Primary # 18
HRI #
Trinomial CA-SC-76
NRHP Status Code 6Z1

Other Listings
Review Code Reviewer Date

P1. Resource Identifier: Hayes Ranch (Guest House)

P2. Location: County Santa Clara and (Address and /or UTM Coordinates. Attach Location Map as required)

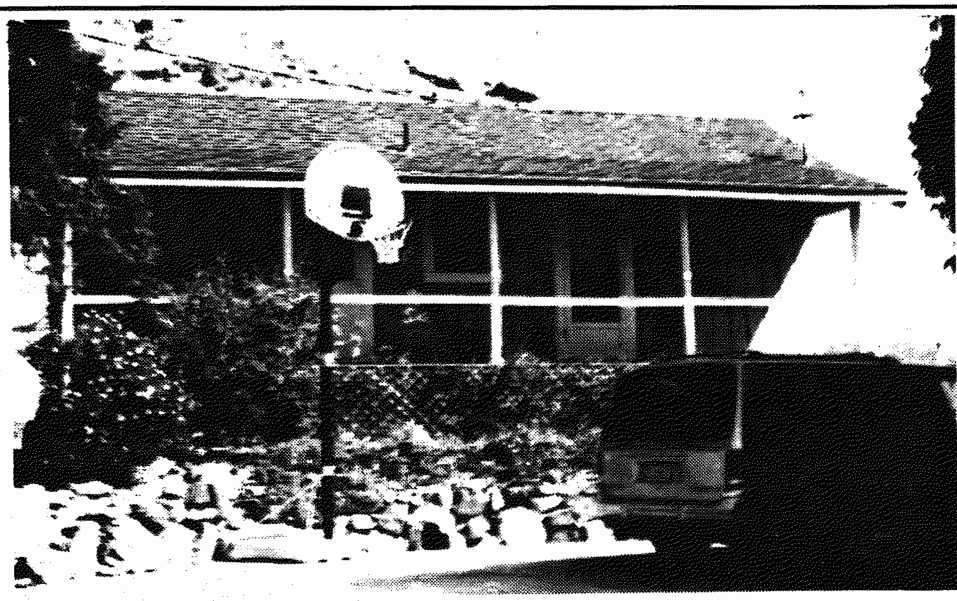
a. Address: 1005 Highland Avenue
City San Martin Zip 95046

b. UTM: USGSQuad Gilroy 7.5' (7.5'/15') Date 1981 ; Zone 3 , 622400 mE/ 4103100 mN

c. Other Locational Data: (Enter parcel #, legal description, directions to resource, and / or other locational data if appropriate)
APN 770-20-004

P3. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)
This small one-story building has a side-gabled roof with a full porch. There are two entrances from the porch, which has a shed roof. The building is clad with board-and-batten and plywood siding. Fenestration consists of two-over-two double-hung sash widows with wood frames.

P4. Resources Present: [x] Building [ ] Structure [ ] Object [ ] Site [ ] Element of District [ ] District



P6. Date Constructed/Age:
[ ] Prehistoric [x] Historic [ ] Both
1915-1970

P7. Owner and Address:
Robert & Royanne Ukestad
1005 Highland Avenue
San Martin, CA 95046

P8. Recorded by: (Name, affiliation, and address)
Glory Anne Laffey
Archives & Architecture
353 Surber Drive
San Jose, CA 95123

P9. Date Recorded: 5/1995

P10. Type of Survey: [x] Intensive [ ] Reconnaissance [ ] Other
Describe:

P11. Report Citation: (Provide full citation or enter "none")
Laffey, G.A., Historical and Architectural Evaluation for the Proposed Lion's Gate Golf Course. Report prepared by Archives & Architecture for Hix Rubenstein Companies, May 1995.

Attachments: [ ] NONE [ ] Location Map [ ] Continuation Sheet [ ] Building, Structure, and Object Record [ ] Linear Resource Record [ ] Archaeological Record [ ] District Record [ ] Milling Station Record [ ] Rock Art Record [ ] Artifact Record [ ] Photograph Record [ ] Other: (List)

PRIMARY RECORD

CALIFORNIA Department of Parks and Recreation
Office of Historic Preservation

Primary # 19
HRI #
Trinomial CA-SC-76
NRHP Status Code 6Z1

Page 18 of

Other Listings
Review Code Reviewer Date

P1. Resource Identifier: Hayes Ranch (Barn)

P2. Location: County Santa Clara and (Address and /or UTM Coordinates. Attach Location Map as required)

a. Address: 1005 Highland Avenue
City San Martin Zip 95046

b. UTM: USGSQuad Gilroy 7.5' (7.5'/15') Date 1981 ; Zone 3 , 622375 mE/ 4103075 mN

c. Other Locational Data: (Enter parcel #, legal description, directions to resource, and / or other locational data if appropriate)
APN 770-20-004

P3. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

This small barn has a gabled roof with overhanging eaves and exposed rafters ends. The building is clad with board-and-batten siding. There large doors glide in metal channels.

P4. Resources Present: [x] Building [ ] Structure [ ] Object [ ] Site [ ] Element of District [ ] District

P6. Date Constructed/Age:
[ ] Prehistoric [x] Historic [ ] Both
1960

P7. Owner and Address:
Robert & Royanne Ukestad
1005 Highland Avenue
San Martin, CA 95046

P8. Recorded by: (Name, affiliation, and address)
Glory Anne Laffey
Archives & Architecture
353 Surber Drive
San Jose, CA 95123

P9. Date Recorded: 5/1995

P10. Type of Survey: [x] Intensive [ ] Reconnaissance [ ] Other
Describe:

P11. Report Citation: (Provide full citation or enter "none")
Laffey, G.A., Historical and Architectural Evaluation for the Proposed Lion's Gate Golf Course. Report prepared by Archives & Architecture for Hix Rubenstein Companies, May 1995.

Attachments: [ ] NONE [ ] Location Map [ ] Continuation Sheet [ ] Building, Structure, and Object Record [ ] Linear Resource Record [ ] Archaeological Record [ ] District Record [ ] Milling Station Record [ ] Rock Art Record [ ] Artifact Record [ ] Photograph Record [ ] Other: (List)

DPR 523A-Test (10/93)

APPENDIX H

Traffic Report

Prepared by

TJKM Transportation Consultants

November 1995

Traffic Study

DRAFT

A Traffic Study of the Proposed Hayes Valley Development

In the County of Santa Clara

November 17, 1995

Prepared by
TJKM Transportation Consultants
4637 Chabot Drive, Suite 214
Pleasanton, California 94588-2754
(510) 463-0611

pjp
142-026R.1MC

TABLE OF CONTENTS

PAGE

continued

TABLE OF CONTENTS

INTRODUCTION AND SUMMARY

Introduction

This report presents the results of TJKM's traffic impact analysis for the proposed Hayes Valley development to be located west of Santa Teresa Boulevard in the San Martin area of Santa Clara County. This project consists of 41 new single-family dwelling units, a 45-room lodging/meeting facility, an 18-hole golf course (with an associated clubhouse and restaurant), and open space. Five existing on-site homes will be demolished and seven on-site employees will be displaced. The study area is illustrated in Figure 1.

The study was prepared for Hayes Valley Development Partners and was conducted in accordance with the requirements set by the County of Santa Clara and the Santa Clara County Congestion Management Agency (CMA).

The traffic analysis focused on project-related traffic impacts on the nearby roadway system. Off-site traffic impacts were evaluated at five study intersections during both the a.m. and p.m. peak hours. The five intersections are listed below:

- Santa Teresa Road/Sunnyside Avenue/Watsonville Road
- Coolidge Avenue/Highland Avenue
- Coolidge Avenue/Monterey Road
- Highland Avenue/San Martin Avenue
- Monterey Road/San Martin Avenue

As required by the CMA, the four study scenarios addressed in this analysis include:

- *Existing* - Current (1994) traffic volumes and roadway conditions.

- *Existing plus Approved* - This scenario assumes existing land use conditions plus future traffic from approved but unbuilt or unoccupied development near the project in the Cities of Morgan Hill and Gilroy in addition to unincorporated areas of Santa Clara County.

- *Existing plus Approved plus Project* - This scenario is identical to the Existing plus Approved scenario, but with project-generated traffic added.

- *Existing plus Approved plus Project plus Expected Growth* - This scenario is identical to the Existing plus Approved plus Project scenario, but with traffic from projected future study area growth added.

Summary

Currently all five study intersections operate at acceptable levels of service during both peak periods. The most congested intersection is found at Monterey Road and San Martin Avenue which operates at LOS C during the p.m. peak hour. When approved traffic in the nearby area is added to the existing volumes, the operating conditions at all five intersections degrade only slightly.

The proposed project is expected to generate approximately 57 a.m. peak hour trips and 93 p.m. peak hour trips. When these trips are assigned to the local road system they do not result in significant impacts at any of the five study intersections. As in all study scenarios the Monterey Road/San Martin Avenue intersection is the most congested intersection, operating at LOS C during the p.m. peak hour. As no significant impacts were found at any of the five study intersections, no off-site traffic-related mitigation measures are recommended for these intersections. However, where the eastern project access road connects with Highland Avenue and Turlock Avenue, it is recommended that the intersection operate with STOP-sign control on the Turlock Avenue approach.

EXISTING CONDITIONS

Roadway Network

The proposed project and the surrounding area are illustrated in Figure 1. Important roadways serving the project area are discussed below.

U.S. 101 (South Valley Freeway) provides regional access to the site and is the major north-south highway in the South Santa Clara area. In the area near the project site, U.S. 101 carries 65,000 to 77,000 vehicles daily[1] with interchanges at Tennant Avenue, San Martin Avenue, and Masten Avenue.

Monterey Road (Business 101), a major four-lane north-south arterial, generally parallels U.S. 101 and provides service through the Cities of Gilroy to the south and Morgan Hill to the north.

Santa Teresa Boulevard/Coolidge Avenue, a two-lane north-south arterial, fronts the east side of the site.

Watsonville Road is a two-lane northeast-southwest arterial that fronts the west side of the site. Watsonville Road runs from the Hecker Pass Highway (State Route 152) up through the project vicinity and connects with Monterey Road in the City of Morgan Hill.

San Martin Avenue and *Highland Avenue* are two-lane east-west collectors connecting Monterey Road (Business 101) and Santa Teresa Boulevard/Coolidge Avenue.

Transit Service

Figure 1 illustrates the existing transit routes in the vicinity of the proposed project. The transit center located closest to the proposed project site is the San Martin Caltrain Station situated on the northeast corner of the Monterey Highway and San Martin Road. Caltrain service includes four northbound runs in the a.m. peak and four southbound runs in the p.m. peak. Parking is provided at the station.

One local and two express bus routes serve the station and the surrounding area. The closest bus stops along these routes in relation to the proposed project are at the intersection of the Monterey Highway and Highland Drive. The local route (68) runs between 4:30 a.m. and 11:45 p.m. with frequencies of 15 minutes during the peak periods, 30 minutes during the midday, and 60 minutes in the late evening. The two express routes (160 and 521) combined offer nine northbound and nine southbound runs during the a.m. and p.m. peaks, respectively. Bicycles are allowed on the buses serving these routes, provided space is available.

Level of Service Analysis Methodology

The operating conditions at signalized study intersections were evaluated using the CAPSSI intersection analysis software based on the Operations method contained in the 1985 *Highway Capacity Manual.* Peak hour intersection conditions are reported as delay estimates with corresponding levels of service. Level of service ratings are qualitative descriptions of intersection operations and are reported using an A through F letter rating system to describe travel delay and congestion. Level of Service (LOS) A indicates free-flow conditions with little or no delay and LOS F indicates jammed conditions with excessive delays and long back ups.

---

[1] Caltrans, *Highway Traffic Volumes*, 1994.

Two-way and four-way STOP-controlled intersections were evaluated using the methodology contained in the 1994 *Highway Capacity Manual.* This methodology also measures level of service in terms of vehicular delay.

Impact Criteria

The minimum acceptable intersection level of service during peak hours in the County of Santa Clara is LOS D (total average delay less than 40 seconds) while the minimum acceptable level of service on facilities monitored by the Santa Clara County CMA is LOS E (total average delay less than 60 seconds). Mitigation is required for any project related traffic impact which causes an intersection to fall below these thresholds.

Results of Level of Service Analysis

TJKM conducted a.m. and p.m. peak hour turning movement counts at the five existing study intersections during the week of April 11, 1994. All local school districts were in session during this week. Figure 2 illustrates the existing peak hour turning movements for the five existing study intersections.

The results of the intersection analysis are summarized in Table I for existing conditions. As the table indicates, all study intersections are currently operating at acceptable levels of service. The Monterey Road/San Martin Avenue intersection operates with the lowest level of service, LOS C (average delay of 17 seconds), during the p.m. peak hour. Appendix A contains the detailed results of the existing level of service analysis.

Table I

Peak Hour Intersection Levels of Service - Existing Conditions

	Intersection	Control	A.M. Peak Hour		P.M. Peak Hour	
			Delay[1]	LOS	Delay[1]	LOS
1	Santa Teresa Boulevard/Sunnyside Avenue/Watsonville Road	4-Way STOP	3.5	A	4.8	A
2	Coolidge Avenue/San Martin Avenue	2-Way STOP	1.2 (3.9)	A (A)	1.5 (5.1)	A (B)
3	Monterey Road/San Martin Avenue	Signal	12	B-	17	C+
4	Santa Teresa Boulevard/Highland Avenue	2-Way STOP	0.4 (4.2)	A (A)	0.6 (4.9)	A (A)
5	Monterey Road/San Martin Avenue	Signal	10	B+	5	A

Note:

1 = Average vehicular delay is measured in seconds per vehicle. For 2-way STOP-controlled intersections, values for delayed movements alone are also given in parentheses.

IMPACTS OF APPROVED PROJECTS

Description

The Approved scenarios consist of development projects approved near the study area that will affect the study roadways. The list of approved projects was developed based on information provided by the Cities of Gilroy and Morgan Hill as well as the County of Santa Clara. (It should be noted that the City of Gilroy has indicated that no approved projects would affect the study area.) Figure 3 illustrates the locations of the projects included in this scenario.

Trip Generation

Table II indicates the approved project trip generation assumptions. Where available, previous traffic analyses of individual projects were used to develop both trip generation and distribution estimates. As Table II indicates, a total of 958 trips are expected to be generated by the approved projects during the a.m. peak hour and 1,010 during the p.m. peak hour.

Table II

Approved Projects Trip Generation

Zone	Use	Size	Daily Trips	A.M. Peak Hour			P.M. Peak Hour		
				In	Out	Total	In	Out	Total
1	South County Court Building	-	-	409	51	460	45	169	214
2	Single-Family	5 d.u.	48	1	3	4	3	2	5
3	Senior Housing	33 d.u.	83	1	1	2	2	1	3
4	Single-Family	6 d.u.	57	1	3	4	4	2	6
5	Single-Family	82 d.u.	783	16	45	61	53	30	83
6	Single-Family	36 d.u.	344	7	20	27	23	13	36
7	Single-Family	84 d.u.	802	16	46	62	54	31	85
8	Single-Family	32 d.u.	306	6	18	24	21	12	32
9	Single-Family	44 d.u.	420	8	24	33	28	16	44
10	RV Park	272 Spaces	1,088	9	35	44	52	35	87
11	Commercial	27 k.s.f.	1,878	59	34	93	85	85	171
12	Single-Family	24 d.u.	229	5	13	18	16	9	24
13	Commercial with Gas Station	22 k.s.f.	3,759	70	50	120	104	104	209
14	Single-Family	11 d.u.	105	2	6	8	7	4	11
	TOTAL			610	348	958	498	512	1,010

Note: d.u. = dwelling unit, k.s.f. = 1,000 square feet

Level of Service Analysis

Figure 4 illustrates the projected turning movement volumes for this scenario. Table III summarizes the results of the level of service analysis for this scenario. As the table indicates, all study intersections are projected to operate at acceptable levels of service under this scenario. The lowest operating condition, LOS C (average delay of 22 seconds), is again found at the Monterey Road/San Martin Avenue intersection during the p.m. peak hour. Appendix B contains the detailed calculations for this scenario.

Table III

Peak Hour Intersection Levels of Service - Existing plus Approved

Intersection		Existing				Existing plus Approved			
		A.M. Peak Hour		P.M. Peak Hour		A.M. Peak Hour		P.M. Peak Hour	
		Delay[1]	LOS	Delay[1]	LOS	Delay[1]	LOS	Delay[1]	LOS
1	Santa Teresa/Sunnyside/Watsonville	3.5	A	4.8	A	4.3	A	6.5	B
2	Coolidge/San Martin	1.2 (3.9)	A (A)	1.5 (5.1)	A (B)	1.2 (4.1)	A (A)	1.5 (5.4)	A (B)
3	Monterey/San Martin	12	B-	17	C+	14	B-	22	C-
4	Santa Teresa/Highland	1.2 (3.9)	A (A)	1.5 (5.1)	A (B)	1.5 (2.6)	A (A)	1.3 (3.2)	A (A)
5	Monterey/San Martin	10	B+	5	A	10	B+	5	B+

Note:
1 = Average vehicular delay is measured in seconds per vehicle. For 2-way STOP-controlled intersections, values for delayed movements alone are also given in parentheses.

IMPACTS OF THE PROPOSED PROJECT

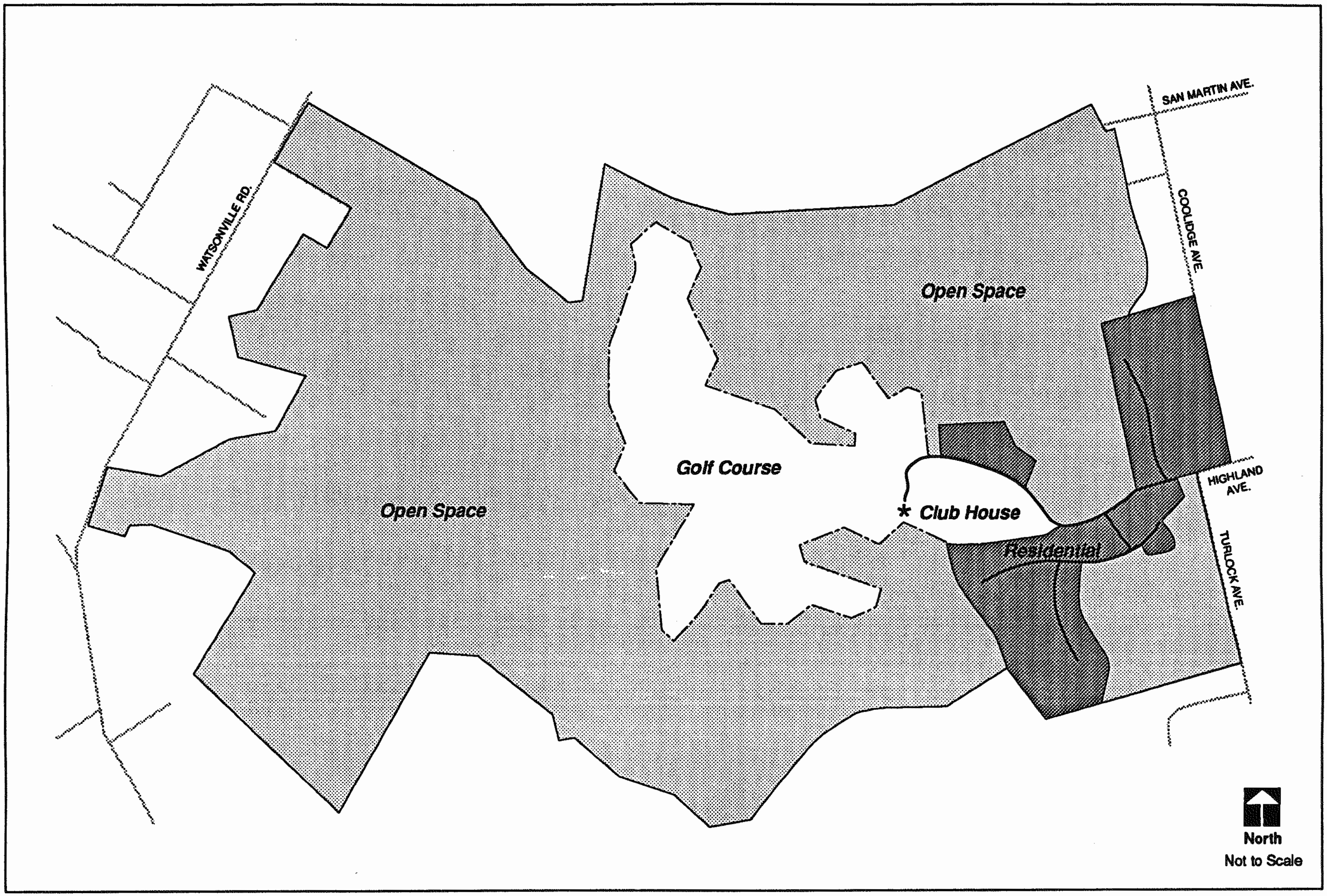
Project Description

Figure 5 illustrates a preliminary site plan for the proposed project. The project consists of 41 new single-family dwelling units, a 45-room lodging/meeting facility, one 18-hole golf course (with an associated clubhouse and restaurant), and open space. Five existing homes on the site will be demolished and seven employees on the site will be displaced. One existing on-site home will remain. The majority of the residential roads on the site will be privately owned and gated. Vehicle access to the project site will occur solely via the eastern project entrance from Highland Avenue. Emergency and service vehicle access will be provided from Watsonville Road.

Trip Generation and Assignment

Table IV illustrates the estimated peak hour trip generation for the proposed project. The trip generation assumptions for the residential and lodging portion of the project are based on information contained in ITE's *Trip Generation* (Fifth Edition, ITE). The five homes to be demolished were subtracted from the total trip generation, as were the displaced employees. An average occupancy rate of 78 percent was assumed for the 45 guest rooms (yielding 35 occupied rooms). The golf course trip generation assumptions are based on previous studies performed by TJKM and on data specific to this project as described in Appendix C. As the appendix states, some of the golfers are assumed to lodge in the provided accommodations, and some are assumed to originate off-site. Those that lodge are accounted for under the "Lodging" use. The restaurant trips were discounted by 35 percent to account for the fact that many of those dining will be related to the golf and lodging uses.

As Table IV indicates, the project is expected to generate 57 trips during the a.m. peak hour and 93 trips during the p.m. peak hour. These estimates take into account a slight decrease in traffic due to the displacement of seven employees currently on the site.



Santa Clara County
Hayes Valley TIS
Site Plan

Figure 5

TJKM

142-026 - 11/95 - K2

Table IV

Project Trip Generation

Use	Size	A.M. Peak Hour					P.M. Peak Hour				
		Rate	In:Out	In	Out	Tot	Rate	In:Out	In	Out	Tot
New Trips											
Single- Family[1]	41 du[2]	0.74	26:74	8	22	30	1.01	64:36	26	15	41
Lodging[3]	35 occ. rooms	0.33	60:40	7	5	12	0.48	37:63	6	11	17
Golf Course[4]	1 course, 18 holes[5]	-	67:33	14	7	21	-	48:52	11	14	25
Restaurant	4 ksf	0.92	94:6	4	0	4	7.66	70:30	22	9	31
Reductions											
Internal Restaurant Trips (35%)[6]				(1)		(1)			(8)	(3)	(11)
Existing Residences to be Removed	5 du	0.74	26:74	(1)	(3)	(4)	1.01	64:36	(3)	(2)	(5)
Displaced Employees	7 employees	-	100:0	(5)		(5)	-	0:100		(5)	(5)
NET TOTAL				**26**	**31**	**57**			**54**	**39**	**93**

Notes:

[1] Residential trip rates from the ITE Single Family Residential category (Land Use 210).

[2] One additional dwelling unit will remain; however, it will generate no new trips.

[3] Lodging trip rates from the ITE Resort Hotel category (Land Use 330). The rate is based on occupied rooms. The size shown reflects a 45-room facility with an assumed occupancy rate of 78 percent.

[4] Golf course information based on site specific data and previous studies by TJKM (See Appendix D). Employees are included. Golfers who stay on-site are accounted for under the "Lodging" use.

[5] One standard 18-hole golf course.

[6] Reductions assume that 35 percent of restaurant trips will be linked with golf/lodging trips.

Project trip distribution assumptions were developed based on existing travel patterns, knowledge of the study area, and information contained in previous traffic studies. Figure 6 illustrates the trip distribution assumptions for the proposed project for both residential and golf course/lodging/restaurant traffic.

Existing plus Approved plus Project Level of Service Analysis

Based on the project trip distribution assumptions, project trips were assigned to the local roadway network. Figure 7 illustrates the projected study intersection turning movements under this scenario. Table V summarizes the results of the level of service analysis. Detailed calculations are contained in Appendix D. As the table indicates, all study intersections are projected to continue to operate at acceptable levels of service under this scenario. The most congested study intersection will continue to be Monterey Road/San Martin Avenue (LOS C, delay of 23 seconds); however, the intersection will operate well below the acceptable delay threshold as defined by the County standards.

Table V

Peak Hour Intersection Levels of Service - Approved Scenarios

	Intersection	Existing				Existing plus Approved				Existing plus Approved plus Project			
		A.M. Peak Hour		P.M. Peak Hour		A.M. Peak Hour		P.M. Peak Hour		A.M. Peak Hour		P.M. Peak Hour	
		Delay[1]	LOS	Delay[1]	LOS	Delay[1]	LOS	Delay[1]	LOS	Delay[1]	LOS	Delay[1]	LOS
1	Santa Teresa/ Sunnyside/ Watsonville	3.5	A	4.8	A	4.3	A	6.5	B	4.5	A	6.8	B
2	Coolidge/ San Martin	1.2 (3.9)	A (A)	1.5 (5.1)	A (B)	1.2 (4.1)	A (A)	1.5 (5.4)	A (B)	1.2 (4.3)	A (A)	1.5 (5.6)	A (B)
3	Monterey/ San Martin	12	B-	17	C+	14	B-	22	C-	14	B-	23	C-
4	Santa Teresa/ Highland	0.4 (4.2)	A (A)	0.6 (4.9)	A (A)	1.5 (2.6)	A (A)	1.3 (3.2)	A (A)	1.4 (4.7)	A (A)	1.8 (6.2)	A (B)
5	Monterey/ San Martin	10	B+	5	A	10	B+	5	B+	5	B+	5	B+

Note:
1 = Average vehicular delay is measured in seconds per vehicle. For 2-way STOP-controlled intersections, values for delayed movements alone are also given in parentheses.

FUTURE CONDITIONS

In accordance with CMA requirements, an expected growth scenario has been evaluated as part of this analysis. This scenario includes the traffic growth that is expected between the date of the traffic counts and the expected date of completion of the proposed development. This is assumed to be a three-year period; an annual growth factor (1.2 percent per year) is applied to the count data (not to the approved or project trips).

Intersection Conditions

The resulting level of service conditions for this scenario are summarized in Table VI, the forecasted turning movement volumes are given in Figure 8, and the detailed calculations are given in Appendix E. As the table indicates, all study intersections are projected to continue to operate at acceptable levels of service with only slight declines from the Existing plus Approved plus Project scenario.

Table VI

Peak Hour Intersection Levels of Service - Existing plus Approved plus Project plus Expected Growth Conditions

	Intersection	A.M. Peak Hour		P.M. Peak Hour	
		Delay[1]	LOS	Delay[1]	LOS
1	Santa Teresa Boulevard/Sunnyside Avenue/Watsonville Road	4.7	A	7.2	B
2	Coolidge Avenue/San Martin Avenue	1.2 (4.3)	A (A)	1.6 (5.8)	A (B)
3	Monterey Road/San Martin Avenue	14	B-	24	C-
4	Santa Teresa Boulevard/Highland Avenue	1.4 (4.7)	A (A)	1.8 (6.4)	A (B)
5	Monterey Road/San Martin Avenue	5	B+	6	B+

Note:

1 = Average vehicular delay is measured in seconds per vehicle. For 2-way STOP-controlled intersections, values for delayed movements alone are also given in parentheses.

MITIGATION MEASURES

The previous sections have identified no significant traffic impacts to the study intersections. Therefore, no off-site mitigation measures are recommended at the five intersections. However, where the eastern project access road connects to Highland Avenue and Turlock Avenue, it is recommended that the intersection operate with STOP-sign control on the Turlock Avenue approach.

The project applicant proposes to offer shuttle services to the Caltrain station on San Martin Avenue. This measure could potentially reduce the project's vehicular trip reduction. However, since no project-related intersection impacts have been identified, the shuttle service will have no impact on the findings of this analysis.

STUDY REFERENCES

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APPENDIX A

Results of the Intersection Analysis
Existing Conditions

LOS Software by TJKM Transportation Consultants

Condition: A.M. EXISTING CONDITIONS 05/06/94

INTERSECTION 1 SUNNYSIDE AVE/WATSONVILLE SANTA CLARA COUNTY
Count Date 4/12/94 Time 7:00-9:00 AM Peak Hour 7:15- 8:15AM

```
TRB All-Way STOP     RIGHT THRU LEFT
---------------         19   78   11
                         |    |    |
              ^          |    |    |         ^
              |        <---   v   --->       |
LEFT    31 ---    1.1   1.1  1.1  1.1   1.1 ---    14  RIGHT

THRU   185 --->   1.1  (NO. OF LANES)   1.1<---    63  THRU

RIGHT   22 ---    1.0   1.1  1.1  1.1   1.1 ---    42  LEFT
              |        <---   ^   --->       |
              v          |    |    |         v         SIG WARRANTS:
  N                      |    |    |                     Urb=N, Rur=N
W + E                   12  110   65
  S                    LEFT THRU RIGHT
```

RANGE CHECK VALUE	MIN	MAX	NB	SB	EB	WB
VOLUME PROPORTION	0.20	0.50	0.29	0.17*	0.37	0.18*
APPROACH LANES	1	3	1	1	2	1
LEFT TURN PROPORTION	0.00	0.35	0.07	0.11	0.13	0.35*
RIGHT TURN PROPORTION	0.00	0.35	0.35	0.18	0.09	0.12

* = VALUE LIES OUTSIDE VALID INPUT RANGE. USE RESULTS WITH CAUTION.

APP	ORIGINAL VOLUME	PEAK HOUR FACTOR -LT- -TH- -RT-	ADJUSTED VOLUME	CAPACITY	V/C	DELAY	LOS
NB	187	0.95 0.95 0.95	197	475	0.41	4.8	A
SB	108	0.95 0.95 0.95	114	485	0.24	2.4	A
EB	238	0.95 0.95 0.95	251	772	0.33	3.4	A
WB	119	0.95 0.95 0.95	125	477	0.26	2.7	A

DELAY= 3.5 SEC/VEH LOS= A

INT=142026EX.INT,VOL=142026EX.AMV,CAP=...VCCAP.TAB

LOS Software by TJKM Transportation Consultants

Condition: P.M. EXISTING CONDITIONS 05/06/94

INTERSECTION 1 SUNNYSIDE AVE/WATSONVILLE SANTA CLARA COUNTY
Count Date 4/12/94 Time 4:00-6:00 PM Peak Hour 4:00- 5:00PM

```
TRB All-Way STOP     RIGHT THRU LEFT
---------------         55  110   24
                         |    |    |
              ^          |    |    |         ^
              |        <---   v   --->       |
LEFT    38 ---    1.1   1.1  1.1  1.1   1.1 ---    24  RIGHT

THRU   142 --->   1.1  (NO. OF LANES)   1.1<---   166  THRU

RIGHT   16 ---    1.0   1.1  1.1  1.1   1.1 ---    51  LEFT
              |        <---   ^   --->       |
              v          |    |    |         v         SIG WARRANTS:
  N                      |    |    |                     Urb=N, Rur=N
W + E                   18   89   54
  S                    LEFT THRU RIGHT
```

RANGE CHECK VALUE	MIN	MAX	NB	SB	EB	WB
VOLUME PROPORTION	0.20	0.50	0.21	0.24	0.25	0.31
APPROACH LANES	1	3	1	1	2	1
LEFT TURN PROPORTION	0.00	0.35	0.11	0.13	0.19	0.21
RIGHT TURN PROPORTION	0.00	0.35	0.34	0.29	0.08	0.10

APP	ORIGINAL VOLUME	PEAK HOUR FACTOR -LT- -TH- -RT-	ADJUSTED VOLUME	CAPACITY	V/C	DELAY	LOS
NB	161	0.95 0.95 0.95	170	460	0.37	4.1	A
SB	189	0.95 0.95 0.95	199	483	0.41	4.8	A
EB	196	0.95 0.95 0.95	206	777	0.27	2.7	A
WB	241	0.95 0.95 0.95	254	496	0.51	7.0	B

DELAY= 4.8 SEC/VEH LOS= A

INT=142026EX.INT,VOL=142026EX.PMV,CAP=...VCCAP.TAB

1994 Highway Capacity Manual Unsignalized Intersection Methodology

East/West Street: Coolidge Ave.
North/South Street: San Martin Ave.
Title: Existing (A.M.)

2-WAY STOP CONTROL

The North/South street is the major street.

			Southbound Right	Southbound Through	Southbound Left			
	Volume		0	120	38		Volume	
		Lanes	0	1	0	Lanes		
Eastbound Left	0	0	1 indicates an exclusive lane			0	22	Westbound Right
Eastbound Through	7	1	for right and left turns. Zero			1	3	Westbound Through
Eastbound Right	1	0	indicates a shared lane.			0	31	Westbound Left
		Lanes	0	1	0	Lanes		
	Volume		0	92	35		Volume	
			Northbound Left	Northbound Through	Northbound Right			

Peak Hour Factor (default = 1.00): 0.90
Pass. Car Equiv. factor (default = 1.1)

Turning Movement		Volume (vph) Actual	Adjustec	Conflicting Volume (vph)	Movement Capacity (vph)	Delay (secs.)	LOS
Shared	9	1					
EB - TRL	8	7	10	316	749	4.87	A
Shared	7	0					

Turning Movement		Volume (vph) Actual	Adjustec	Conflicting Volume (vph)	Movement Capacity (vph)	Delay (secs.)	LOS
Shared	12	22					
WB - TRL	11	3	66	297	826	4.73	A
Shared	10	31					

Turning Movement		Volume (vph) Actual	Adjustec	Conflicting Volume (vph)	Movement Capacity (vph)	Delay (secs.)	LOS
Shared	1	38	46	141	1469	2.53	A
Shared	4	0	0	133	1482	2.43	A

WHOLE INTERSECTION	1.24	A
DELAYED MOVEMENTS	3.91	A

1994 Highway Capacity Manual Unsignalized Intersection Methodology

East/West Street: Coolidge Ave.
North/South Street: San Martin Ave.
Title: Existing (P.M.)

2-WAY STOP CONTROL

The North/South street is the major street.

			Southbound Right	Southbound Through	Southbound Left			
	Volume		2	143	39		Volume	
		Lanes	0	1	0	Lanes		
Eastbound Left	1	0	1 indicates an exclusive lane			0	27	Right Westbound
Eastbound Through	2	1	for right and left turns. Zero			1	5	Through Westbound
Eastbound Right	4	0	indicates a shared lane.			0	53	Left Westbound
		Lanes	0	1	0	Lanes		
	Volume		3	163	49		Volume	
			Northbound Left	Northbound Through	Northbound Right			

Peak Hour Factor (default = 1.00): 0.90
Pass. Car Equiv. factor (default = 1.1):

Turning Movement		Volume (vph) Actual	Adjustec	Conflicting Volume (vph)	Movement Capacity (vph)	Delay (secs.)	LOS
Shared	9	4					
EB - TRL	8	2	7	441	819	4.43	A
Shared	7	1					

Turning Movement		Volume (vph) Actual	Adjustec	Conflicting Volume (vph)	Movement Capacity (vph)	Delay (secs.)	LOS
Shared	12	27					
WB - TRL	11	5	105	415	688	6.17	B
Shared	10	53					

Turning Movement		Volume (vph) Actual	Adjustec	Conflicting Volume (vph)	Movement Capacity (vph)	Delay (secs.)	LOS
Shared	1	39	47	235	1325	2.82	A
Shared	4	3	3	161	1437	2.51	A

WHOLE INTERSECTION	1.52	A
DELAYED MOVEMENTS	5.06	B

CAPSSI 04-07-95
COMPREHENSIVE ANALYSIS PROGRAM
FOR A SINGLE SIGNALIZED INTERSECTION *

EXISTING
SOLUTION USING REQUIRED CYCLE TIME

FLN:3-exa
3. Monterey/San Martin A.M Peak Hour Scenario 1

Movement	EBT	EBL	EBR	SBT	SBL	SBR	WBT	WBL	WBR	NBT	NBL	NBR
Phase 1 - 26 secs	X	X	X	.	.	.	X	X	X	.	.	.
Phase 2 - 5 secs	.	.	.	.	X	.	.	.	.	.	X	.
Phase 3 - 4 secs	.	.	.	X	X	X	.	.	.	.	.	.
Phase 4 - 26 secs	.	.	.	X	.	X	.	.	.	X	.	X
Phase 5 - 0 secs	.	.	.	.	.	.	.	.	.	.	.	.
Phase 6 - 0 secs	.	.	.	.	.	.	.	.	.	.	.	.
Critical Mvmt-**					****		****			****		
Peak 15 Vol -vph	74	18	10	231	65	17	41	82	85	188	10	59
Saturation -vph	1300	Shrd	1800	3600	1700	1800	1300	Shrd	Shrd	3600	1700	Shrd
Lost time -sec	4.00	-	2.00	6.00	4.00	2.00	4.00	-	-	6.00	4.00	-
Relative Sat 'X'	0.20	-	0.01	0.16	0.47	0.02	0.44	-	-	0.21	0.36	-
Effective Gr-sec	22	-	24	24	5	28	22	-	-	20	1	-
Move Time -sec	26	-	26	30	9	30	26	-	-	26	5	-
Min/Ped Time-sec	26	-	26	26	4	26	26	-	-	26	4	-
Prog Factor PAF	1.00	-	1.00	1.00	1.00	1.00	1.00	-	-	1.00	1.00	-
AvDelay/veh -sec	10	-	9	9	22	7	12	-	-	11	26	-
Level of Service	B-	-	B+	B+	C-	B+	B-	-	-	B-	D+	-
Av.'Q'/ lane veh	1	-	0	1	1	0	2	-	-	1	0	-
Veh Stopping %	69	-	61	65	95	55	76	-	-	72	99	-
Do Veh Clear ?	YES	-	YES	YES	YES	YES	YES	-	-	YES	YES	-

Whole Intersection - Weighted Av Delay (sec) = 12 Level of Service = B-
Critical Movements - Weighted Av Delay (sec) = 13 Level of Service = B-
'' '' - Intersection Capacity Utilization (ICU) = 0.35

Required Cycle Length is 61 seconds (All Minimum times are satisfied)

* CAPSSI (Release 11) - Based on Delay Methodology Per 1985 Highway Capacity Manual

C A P S S I
COMPREHENSIVE ANALYSIS PROGRAM
FOR A SINGLE SIGNALIZED INTERSECTION *

04-07-95

Santa Clara County
EXISTING
SOLUTION USING REQUIRED CYCLE TIME

FLN:3-exp

3. Monterey/San Martin — P.M Peak Hour — Scenario 1

Movement	EBT	EBL	EBR	SBT	SBL	SBR	WBT	WBL	WBR	NBT	NBL	NBR
Phase 1 - 32 secs	X	X	X	.	.	.	X	X	X	.	.	.
Phase 2 - 5 secs	.	.	.	.	X	.	.	.	.	.	X	.
Phase 3 - 9 secs	.	.	.	X	X	X	.	.	.	.	.	.
Phase 4 - 26 secs	.	.	.	X	.	X	.	.	.	X	.	X
Phase 5 - 0 secs	.	.	.	.	.	.	.	.	.	.	.	.
Phase 6 - 0 secs	.	.	.	.	.	.	.	.	.	.	.	.
Critical Mvmt-**					****		****			****		
Peak 15 Vol -vph	82	15	15	447	162	38	77	138	175	327	12	132
Saturation -vph	1100	Shrd	1800	3600	1700	1800	1300	Shrd	Shrd	3600	1700	Shrd
Lost time -sec	4.00	-	2.00	6.00	4.00	2.00	4.00	-	-	6.00	4.00	-
Relative Sat 'X'	0.23	-	0.02	0.31	0.69	0.05	0.77	-	-	0.46	0.51	-
Effective Gr-sec	28	-	30	29	10	33	28	-	-	20	1	-
Move Time -sec	32	-	32	35	14	35	32	-	-	26	5	-
Min/Ped Time-sec	26	-	26	26	4	26	26	-	-	26	4	-
Prog Factor PAF	1.00	-	1.00	1.00	1.00	1.00	1.00	-	-	1.00	1.00	-
AvDelay/veh -sec	11	-	9	11	28	8	20	-	-	17	39	-
Level of Service	B-	-	B+	B-	D+	B+	C+	-	-	C+	D-	-
Av.'Q'/ lane veh	1	-	0	3	3	0	5	-	-	3	0	-
Veh Stopping %	67	-	59	68	95	55	87	-	-	83	99	-
Do Veh Clear ?	YES	-	YES	YES	YES	YES	YES	-	-	YES	YES	-

Whole Intersection - Weighted Av Delay (sec) = 17 Level of Service = C+
Critical Movements - Weighted Av Delay (sec) = 20 Level of Service = C+
'' '' - Intersection Capacity Utilization (ICU) = 0.65

Required Cycle Length is 72 seconds (All Minimum times are satisfied)

* CAPSSI (Release 11) - Based on Delay Methodology Per 1985 Highway Capacity Manual

1994 Highway Capacity Manual Unsignalized Intersection Methodology

East/West Street: Highland

North/South Street: Santa Teresa

Title: Existing (A.M.)

2-WAY STOP CONTROL

The North/South street is the major street.

			Southbound					
			Right	Through	Left			
	Volume		3	143	6		Volume	
		Lanes	0	1	1	Lanes		
Left	2	0	1 indicates an exclusive lane			0	4	Right
Eastbound Through	4	1	for right and left turns. Zero			1	3	Through Westbound
Right	1	0	indicates a shared lane.			0	7	Left
		Lanes	1	1	0	Lanes		
	Volume		0	125	9		Volume	
			Left	Through	Right			
				Northbound				

Peak Hour Factor (default = 1.00):	0.90
Pass. Car Equiv. factor (default = 1.1)	

Turning Movement		Volume (vph) Actual	Volume (vph) Adjustec	Conflicting Volume (vph)	Movement Capacity (vph)	Delay (secs.)	LOS
Shared	9	1					
EB - TRL	8	4	7	317	762	4.77	A
Shared	7	2					

Turning Movement		Volume (vph) Actual	Volume (vph) Adjustec	Conflicting Volume (vph)	Movement Capacity (vph)	Delay (secs.)	LOS
Shared	12	4					
WB - TRL	11	3	16	313	781	4.71	A
Shared	10	7					

Turning Movement		Volume (vph) Actual	Volume (vph) Adjustec	Conflicting Volume (vph)	Movement Capacity (vph)	Delay (secs.)	LOS
SB - Left	1	6	8	149	1456	2.49	A
NB - Left	4	0	0	162	1435	2.51	A

WHOLE INTERSECTION	0.38	A
DELAYED MOVEMENTS	4.15	A

1994 Highway Capacity Manual Unsignalized Intersection Methodology

East/West Street: Highland
North/South Street: Santa Teresa
Title: Existing (P.M.)

2-WAY STOP CONTROL

The North/South street is the major street.

			Southbound Right	Southbound Through	Southbound Left			
	Volume		3	178	11		Volume	
		Lanes	0	1	1	Lanes		
Eastbound Left	3	0	1 indicates an exclusive lane			0	5	Right Westbound
Eastbound Through	4	1	for right and left turns. Zero			1	6	Through Westbound
Eastbound Right	5	0	indicates a shared lane.			0	14	Left Westbound
		Lanes	1	1	0	Lanes		
	Volume		0	203	2		Volume	
			Northbound Left	Northbound Through	Northbound Right			

Peak Hour Factor (default = 1.00): 0.90
Pass. Car Equiv. factor (default = 1.1)

Turning Movement		Volume (vph) Actual	Adjustec	Conflicting Volume (vph)	Movement Capacity (vph)	Delay (secs.)	LOS
Shared	9	5					
EB - TRL	8	4	14	440	781	4.70	A
Shared	7	3					

Turning Movement		Volume (vph) Actual	Adjustec	Conflicting Volume (vph)	Movement Capacity (vph)	Delay (secs.)	LOS
Shared	12	5					
WB - TRL	11	6	33	440	653	5.80	B
Shared	10	14					

Turning Movement		Volume (vph) Actual	Adjustec	Conflicting Volume (vph)	Movement Capacity (vph)	Delay (secs.)	LOS
SB - Left	1	11	13	228	1335	2.72	A
NB - Left	4	0	0	201	1375	2.62	A

WHOLE INTERSECTION	0.61	A
DELAYED MOVEMENTS	4.88	A

CAPSSI
COMPREHENSIVE ANALYSIS PROGRAM
FOR A SINGLE SIGNALIZED INTERSECTION *

04-07-95

Santa Clara County
EXISTING
SOLUTION USING REQUIRED CYCLE TIME

FLN:5-exa

5. Monterey/Highland   A.M Peak Hour   Scenario 1

Movement	EBT	EBL	EBR	SBT	SBL	SBR	WBT	WBL	WBR	NBT	NBL	NBR
Phase 1 - 26 secs	.	X	X	.	.	.	.	.	.	.	.	.
Phase 2 - 9 secs	.	.	.	.	.	.	.	.	.	X	X	.
Phase 3 - 31 secs	.	.	.	X	.	X	.	.	.	X	.	.
Phase 4 - 0 secs	.	.	.	.	.	.	.	.	.	.	.	.
Phase 5 - 0 secs	.	.	.	.	.	.	.	.	.	.	.	.
Phase 6 - 0 secs	.	.	.	.	.	.	.	.	.	.	.	.
Critical Mvmt-**			****	****							****	
Peak 15 Vol -vph		25	27	230		51				245	55	
Saturation -vph		1700	1800	3600		1800				3600	1700	
Lost time -sec		5.00	2.00	6.00		2.00				6.00	4.00	
Relative Sat 'X'		0.05	0.04	0.17		0.06				0.13	0.43	
Effective Gr-sec		21	24	25		29				34	5	
Move Time -sec		26	26	31		31				40	9	
Min/Ped Time-sec		5	26	26		26				15	4	
Prog Factor PAF		1.00	1.00	1.00		1.00				1.00	1.00	
AvDelay/veh -sec		12	10	10		8				6	24	
Level of Service		B-	B-	B-		B+				B+	C-	
Av.'Q'/ lane veh		0	0	1		1				1	1	
Veh Stopping %		69	65	66		58				52	96	
Do Veh Clear ?		YES	YES	YES		YES				YES	YES	

Whole Intersection - Weighted Av Delay (sec) = 10 Level of Service = B+
Critical Movements - Weighted Av Delay (sec) = 13 Level of Service = B-
" " - Intersection Capacity Utilization (ICU) = 0.14

Required Cycle Length is 66 seconds (All Minimum times are satisfied)

* CAPSSI (Release 11) - Based on Delay Methodology Per 1985 Highway Capacity Manual

C A P S S I
COMPREHENSIVE ANALYSIS PROGRAM
FOR A SINGLE SIGNALIZED INTERSECTION *

04-07-95

Santa Clara County
EXISTING
SOLUTION USING REQUIRED CYCLE TIME

FLN:5-exp

5. Monterey/Highland   P.M Peak Hour   Scenario 1

Movement	EBT	EBL	EBR	SBT	SBL	SBR	WBT	WBL	WBR	NBT	NBL	NBR
Phase 1 - 8 secs	.	X	X	.	.	.	.	.	.	.	.	.
Phase 2 - 7 secs	.	.	.	.	.	.	.	.	.	X	X	.
Phase 3 - 29 secs	.	.	.	X	.	X	.	.	.	X	.	.
Phase 4 - 0 secs	.	.	.	.	.	.	.	.	.	.	.	.
Phase 5 - 0 secs	.	.	.	.	.	.	.	.	.	.	.	.
Phase 6 - 0 secs	.	.	.	.	.	.	.	.	.	.	.	.

	EBT	EBL	EBR	SBT	SBL	SBR	WBT	WBL	WBR	NBT	NBL	NBR
Critical Mvmt-**		****		****							****	
Peak 15 Vol -vph		48	49	467		43				359	44	
Saturation -vph		1700	1800	3600		1800				3600	1700	
Lost time -sec		5.00	2.00	6.00		2.00				6.00	4.00	
Relative Sat 'X'		0.41	0.20	0.25		0.04				0.15	0.38	
Effective Gr-sec		3	6	23		27				30	3	
Move Time -sec		8	8	29		29				36	7	
Min/Ped Time-sec		5	26	26		26				15	4	
Prog Factor PAF		1.00	1.00	1.00		1.00				1.00	1.00	
AvDelay/veh -sec		16	13	4		3				2	16	
Level of Service		C+	B-	A		A				A	C+	
Av.'Q'/ lane veh		1	1	1		0				1	1	
Veh Stopping %		96	89	55		40				35	96	
Do Veh Clear ?		YES	YES	YES		YES				YES	YES	

Whole Intersection - Weighted Av Delay (sec) = 5 Level of Service = A
Critical Movements - Weighted Av Delay (sec) = 6 Level of Service = B+
'' '' - Intersection Capacity Utilization (ICU) = 0.28

Required Cycle Length is 44 seconds (All Minimum times are satisfied)

* CAPSSI (Release 11) - Based on Delay Methodology Per 1985 Highway Capacity Manual

APPENDIX B

Results of the Intersection Analysis
Existing plus Approved Conditions

```
LOS Software by TJKM Transportation Consultants
------------------------------------------------------------------------
Condition: A.M. EXISTING + APPROVED CONDITIONS                 04/19/95
------------------------------------------------------------------------
INTERSECTION      1 SUNNYSIDE AVE/WATSONVILLE         SANTA CLARA COUNTY
Count Date                    Time               Peak Hour 7:15- 8:15AM
------------------------------------------------------------------------
TRB All-Way STOP    RIGHT THRU LEFT
----------------      21  105   14
                       |   |   |
           ^           |   |   |          ^
           |         <---  v  --->        |
LEFT    32 ---  1.1   1.1  1.1  1.1   1.1 ---   23  RIGHT

THRU   194 ---> 1.1   (NO. OF LANES)  1.1<---   75  THRU

RIGHT   22 ---  1.0   1.1  1.1  1.1   1.1 ---   71  LEFT
           |         <---  ^  --->        |
           v           |   |   |          v           SIG WARRANTS:
  N                    |   |   |                        Urb=N, Rur=N
W + E                 12  116   78
  S                  LEFT THRU RIGHT
------------------------------------------------------------------------
RANGE CHECK VALUE              MIN      MAX  |  NB     SB     EB     WB
-------------------------------------------+----------------------------
VOLUME PROPORTION              0.20     0.50 |  0.27   0.18*  0.32   0.22
APPROACH LANES                 1        3    |  1      1      2      1
LEFT TURN PROPORTION           0.00     0.35 |  0.06   0.10   0.13   0.42*
RIGHT TURN PROPORTION          0.00     0.35 |  0.38*  0.15   0.09   0.13
-------------------------------------------+----------------------------
* = VALUE LIES OUTSIDE VALID INPUT RANGE.  USE RESULTS WITH CAUTION.
------------------------------------------------------------------------
    ORIGINAL  PEAK HOUR FACTOR   ADJUSTED
APP  VOLUME    -LT- -TH- -RT-    VOLUME     CAPACITY   V/C   DELAY   LOS
------------------------------------------------------------------------
NB    206      0.95 0.95 0.95      217         456     0.48   6.1     B
SB    140      0.95 0.95 0.95      148         488     0.30   3.2     A
EB    248      0.95 0.95 0.95      261         743     0.35   3.8     A
WB    169      0.95 0.95 0.95      178         490     0.36   4.0     A
------------------------------------------------------------------------
                                        DELAY=   4.3 SEC/VEH     LOS= A
------------------------------------------------------------------------
INT=142026EX.INT,VOL=142026EX.AMV+NHAYAP.AMV,CAP=...LOSCAP.TAB
```

```
LOS Software by TJKM Transportation Consultants
------------------------------------------------------------------------
Condition: P.M. EXISTING + APPROVED CONDITIONS                 04/19/95
------------------------------------------------------------------------
INTERSECTION      1 SUNNYSIDE AVE/WATSONVILLE         SANTA CLARA COUNTY
Count Date                    Time               Peak Hour 4:00- 5:00PM
------------------------------------------------------------------------
TRB All-Way STOP    RIGHT THRU LEFT
----------------      56  118   35
                       |   |   |
           ^           |   |   |          ^
           |         <---  v  --->        |
LEFT    40 ---  1.1   1.1  1.1  1.1   1.1 ---   30  RIGHT

THRU   161 ---> 1.1   (NO. OF LANES)  1.1<---  181  THRU

RIGHT   16 ---  1.0   1.1  1.1  1.1   1.1 ---   73  LEFT
           |         <---  ^  --->        |
           v           |   |   |          v           SIG WARRANTS:
  N                    |   |   |                        Urb=N, Rur=B
W + E                 18  106   88
  S                  LEFT THRU RIGHT
------------------------------------------------------------------------
RANGE CHECK VALUE              MIN      MAX  |  NB     SB     EB     WB
-------------------------------------------+----------------------------
VOLUME PROPORTION              0.20     0.50 |  0.23   0.23   0.23   0.31
APPROACH LANES                 1        3    |  1      1      2      1
LEFT TURN PROPORTION           0.00     0.35 |  0.08   0.17   0.18   0.26
RIGHT TURN PROPORTION          0.00     0.35 |  0.42*  0.27   0.07   0.11
-------------------------------------------+----------------------------
* = VALUE LIES OUTSIDE VALID INPUT RANGE.  USE RESULTS WITH CAUTION.
------------------------------------------------------------------------
    ORIGINAL  PEAK HOUR FACTOR   ADJUSTED
APP  VOLUME    -LT- -TH- -RT-    VOLUME     CAPACITY   V/C   DELAY   LOS
------------------------------------------------------------------------
NB    212      0.95 0.95 0.95      224         452     0.50   6.6     B
SB    209      0.95 0.95 0.95      220         505     0.44   5.2     B
EB    217      0.95 0.95 0.95      228         760     0.30   3.1     A
WB    284      0.95 0.95 0.95      300         497     0.60   9.9     B
------------------------------------------------------------------------
                                        DELAY=   6.5 SEC/VEH     LOS= B
------------------------------------------------------------------------
INT=142026EX.INT,VOL=142026EX.PMV+NHAYAP.PMV,CAP=...LOSCAP.TAB
```

1994 Highway Capacity Manual Unsignalized Intersection Methodology

East/West Street: Coolidge Ave.
North/South Street: San Martin Ave.
Title: Existing plus Approved (A.M.)

2-WAY STOP CONTROL

The North/South street is the major street.

			Southbound Right	Southbound Through	Southbound Left			
	Volume		0	155	38		Volume	
		Lanes	0	1	0	Lanes		
Left	0	0	1 indicates an exclusive lane			0	22	Right
Eastbound Through	7	1	for right and left turns. Zero			1	3	Through Westbound
Right	1	0	indicates a shared lane.			0	31	Left
		Lanes	0	1	0	Lanes		
	Volume		0	100	35		Volume	
			Left	Through	Right			
				Northbound				

Peak Hour Factor (default = 1.00): 0.90
Pass. Car Equiv. factor (default = 1.1)

Turning Movement		Volume (vph) Actual	Adjustec	Conflicting Volume (vph)	Movement Capacity (vph)	Delay (secs.)	LOS
Shared	9	1					
EB - TRL	8	7	10	364	706	5.17	B
Shared	7	0					

Turning Movement		Volume (vph) Actual	Adjustec	Conflicting Volume (vph)	Movement Capacity (vph)	Delay (secs.)	LOS
Shared	12	22					
WB - TRL	11	3	66	345	786	5.00	B
Shared	10	31					

Turning Movement		Volume (vph) Actual	Adjustec	Conflicting Volume (vph)	Movement Capacity (vph)	Delay (secs.)	LOS
Shared	1	38	46	150	1454	2.56	A
Shared	4	0	0	172	1419	2.54	A

WHOLE INTERSECTION	1.16	A
DELAYED MOVEMENTS	4.09	A

1994 Highway Capacity Manual Unsignalized Intersection Methodology

East/West Street: Coolidge Ave.
North/South Street: San Martin Ave.
Title: Existing plus Approved (P.M.)

2-WAY STOP CONTROL

The North/South street is the major street.

		Southbound Right	Southbound Through	Southbound Left		
Volume		2	155	39		Volume
	Lanes	0	1	0	Lanes	
Eastbound Left 1	0	1 indicates an exclusive lane			0	27 Westbound Right
Eastbound Through 2	1	for right and left turns. Zero			1	5 Westbound Through
Eastbound Right 4	0	indicates a shared lane.			0	53 Westbound Left
	Lanes	0	1	0	Lanes	
Volume		3	189	49		Volume
		Northbound Left	Northbound Through	Northbound Right		

Peak Hour Factor (default = 1.00): 0.90
Pass. Car Equiv. factor (default = 1.1):

Turning Movement		Volume (vph) Actual	Adjusted	Conflicting Volume (vph)	Movement Capacity (vph)	Delay (secs.)	LOS
Shared	9	4					
EB - TRL	8	2	7	483	788	4.61	A
Shared	7	1					

Turning Movement		Volume (vph) Actual	Adjusted	Conflicting Volume (vph)	Movement Capacity (vph)	Delay (secs.)	LOS
Shared	12	27					
WB - TRL	11	5	105	457	653	6.57	B
Shared	10	53					

Turning Movement		Volume (vph) Actual	Adjusted	Conflicting Volume (vph)	Movement Capacity (vph)	Delay (secs.)	LOS
Shared	1	39	47	264	1283	2.91	A
Shared	4	3	3	174	1416	2.55	A

WHOLE INTERSECTION	1.49	A
DELAYED MOVEMENTS	5.35	B

C A P S S I
COMPREHENSIVE ANALYSIS PROGRAM
FOR A SINGLE SIGNALIZED INTERSECTION *

04-19-95

Santa Clara County
A.M. Existing plus Approved
SOLUTION USING REQUIRED CYCLE TIME

3. Monterey/San Martin — A.M Peak Hour — FLN:3-e&aa Scenario 1

Movement	EBT	EBL	EBR	SBT	SBL	SBR	WBT	WBL	WBR	NBT	NBL	NBR
Phase 1 - 28 secs	X	X	X	.	.	.	X	X	X	.	.	.
Phase 2 - 5 secs	.	.	.	.	X	.	.	.	.	.	X	.
Phase 3 - 6 secs	.	.	.	X	X	X	.	.	.	.	.	.
Phase 4 - 26 secs	.	.	.	X	.	X	.	.	.	X	.	X
Phase 5 - 0 secs	.	.	.	.	.	.	.	.	.	.	.	.
Phase 6 - 0 secs	.	.	.	.	.	.	.	.	.	.	.	.

	EBT	EBL	EBR	SBT	SBL	SBR	WBT	WBL	WBR	NBT	NBL	NBR
Critical Mvmt-**					****		****			****		
Peak 15 Vol -vph	74	18	10	341	113	17	41	165	116	224	10	71
Saturation -vph	1200	Shrd	1800	3600	1700	1800	1300	Shrd	Shrd	3600	1700	Shrd
Lost time -sec	4.00	-	2.00	6.00	4.00	2.00	4.00	-	-	6.00	4.00	-
Relative Sat 'X'	0.21	-	0.01	0.24	0.62	0.02	0.67	-	-	0.27	0.38	-
Effective Gr-sec	24	-	26	26	7	30	24	-	-	20	1	-
Move Time -sec	28	-	28	32	11	32	28	-	-	26	5	-
Min/Ped Time-sec	26	-	26	26	4	26	26	-	-	26	4	-
Prog Factor PAF	1.00	-	1.00	1.00	1.00	1.00	1.00	-	-	1.00	1.00	-
AvDelay/veh -sec	11	-	9	10	25	7	16	-	-	13	28	-
Level of Service	B-	-	B+	B+	D+	B+	C+	-	-	B-	D+	-
Av.'Q'/ lane veh	1	-	0	2	2	0	4	-	-	2	0	-
Veh Stopping %	68	-	60	66	96	54	84	-	-	75	99	-
Do Veh Clear ?	YES	-	YES	YES	YES	YES	YES	-	-	YES	YES	-

Whole Intersection - Weighted Av Delay (sec) = 14 Level of Service = B-
Critical Movements - Weighted Av Delay (sec) = 16 Level of Service = C+
'' '' - Intersection Capacity Utilization (ICU) = 0.50

Required Cycle Length is 65 seconds (All Minimum times are satisfied)

* CAPSSI (Release 11) - Based on Delay Methodology Per 1985 Highway Capacity Manual

C A P S S I
COMPREHENSIVE ANALYSIS PROGRAM
FOR A SINGLE SIGNALIZED INTERSECTION *

04-19-95

Santa Clara County
P.M. Existing plus Approved
SOLUTION USING REQUIRED CYCLE TIME

FLN:3-E&AP

3. Monterey/San Martin   P.M Peak Hour   Scenario 1

Movement	EBT	EBL	EBR	SBT	SBL	SBR	WBT	WBL	WBR	NBT	NBL	NBR
Phase 1 - 40 secs	X	X	X	.	.	.	X	X	X	.	.	.
Phase 2 - 5 secs	.	.	.	.	X	.	.	.	.	.	X	.
Phase 3 - 13 secs	.	.	.	X	X	X	.	.	.	.	.	.
Phase 4 - 26 secs	.	.	.	X	.	X	.	.	.	X	.	X
Phase 5 - 0 secs	.	.	.	.	.	.	.	.	.	.	.	.
Phase 6 - 0 secs	.	.	.	.	.	.	.	.	.	.	.	.

	EBT	EBL	EBR	SBT	SBL	SBR	WBT	WBL	WBR	NBT	NBL	NBR
Critical Mvmt-**					****		****			****		
Peak 15 Vol -vph	82	15	15	499	216	38	77	149	247	411	12	167
Saturation -vph	1100	Shrd	1800	3600	1700	1800	1300	Shrd	Shrd	3600	1700	Shrd
Lost time -sec	4.00	-	2.00	6.00	4.00	2.00	4.00	-	-	6.00	4.00	-
Relative Sat 'X'	0.21	-	0.02	0.35	0.76	0.05	0.85	-	-	0.67	0.59	-
Effective Gr-sec	36	-	38	33	14	37	36	-	-	20	1	-
Move Time -sec	40	-	40	39	18	39	40	-	-	26	5	-
Min/Ped Time-sec	26	-	26	26	4	26	26	-	-	26	4	-
Prog Factor PAF	1.00	-	1.00	1.00	1.00	1.00	1.00	-	-	1.00	1.00	-
AvDelay/veh -sec	11	-	10	14	33	10	25	-	-	24	55	-
Level of Service	B-	-	B+	B-	D	B-	C-	-	-	C-	E-	-
Av.'Q'/ lane veh	1	-	0	4	4	0	6	-	-	5	0	-
Veh Stopping %	63	-	55	70	95	57	90	-	-	91	100	-
Do Veh Clear ?	YES	-	YES	YES	YES	YES	YES	-	-	YES	YES	-

Whole Intersection - Weighted Av Delay (sec) = 22 Level of Service = C-
Critical Movements - Weighted Av Delay (sec) = 26 Level of Service = D+
'' '' - Intersection Capacity Utilization (ICU) = 0.78

Required Cycle Length is 84 seconds (All Minimum times are satisfied)

* CAPSSI (Release 11) - Based on Delay Methodology Per 1985 Highway Capacity Manual

1994 Highway Capacity Manual Unsignalized Intersection Methodology

East/West Street: Highland
North/South Street: Santa Teresa
Title: Existing + Approved (A.M.)

2-WAY STOP CONTROL

The North/South street is the major street.

			Southbound Right	Southbound Through	Southbound Left			
	Volume		0	15	20		Volume	
		Lanes	0	1	1	Lanes		
Eastbound Left	0	0	1 indicates an exclusive lane			0	3	Westbound Right
Eastbound Through	1	1	for right and left turns. Zero			1	0	Westbound Through
Eastbound Right	0	0	indicates a shared lane.			0	7	Westbound Left
		Lanes	1	1	0	Lanes		
	Volume		0	5	7		Volume	
			Northbound Left	Northbound Through	Northbound Right			

Peak Hour Factor (default = 1.00): 0.90
Pass. Car Equiv. factor (default = 1.1)

Turning Movement		Volume (vph) Actual	Adjustec	Conflicting Volume (vph)	Movement Capacity (vph)	Delay (secs.)	LOS
Shared	9	0					
EB - TRL	8	1	1	53	1009	3.57	A
Shared	7	0					

Turning Movement		Volume (vph) Actual	Adjustec	Conflicting Volume (vph)	Movement Capacity (vph)	Delay (secs.)	LOS
Shared	12	3					
WB - TRL	11	0	12	49	1054	3.45	A
Shared	10	7					

Turning Movement		Volume (vph) Actual	Adjustec	Conflicting Volume (vph)	Movement Capacity (vph)	Delay (secs.)	LOS
SB - Left	1	20	24	14	1688	2.16	A
NB - Left	4	0	0	17	1683	2.14	A

WHOLE INTERSECTION	1.52	A
DELAYED MOVEMENTS	2.62	A

1994 Highway Capacity Manual Unsignalized Intersection Methodology

East/West Street: Highland
North/South Street: Santa Teresa
Title: Existing + Approved (P.M.)

2-WAY STOP CONTROL

The North/South street is the major street.

			Southbound Right	Southbound Through	Southbound Left			
	Volume		0	10	3		Volume	
		Lanes	0	1	1	Lanes		
Left	0	0	1 indicates an exclusive lane			0	8	Right
Eastbound Through	1	1	for right and left turns. Zero			1	0	Through Westbound
Right	0	0	indicates a shared lane.			0	12	Left
		Lanes	1	1	0	Lanes		
	Volume		0	17	13		Volume	
			Left	Through	Right			
				Northbound				

Peak Hour Factor (default = 1.00): 0.90
Pass. Car Equiv. factor (default = 1.1)

Turning Movement		Volume (vph) Actual	Adjustec	Conflicting Volume (vph)	Movement Capacity (vph)	Delay (secs.)	LOS
Shared	9	0					
EB - TRL	8	1	1	47	1029	3.50	A
Shared	7	0					

Turning Movement		Volume (vph) Actual	Adjustec	Conflicting Volume (vph)	Movement Capacity (vph)	Delay (secs.)	LOS
Shared	12	8					
WB - TRL	11	0	24	40	1119	3.29	A
Shared	10	12					

Turning Movement		Volume (vph) Actual	Adjustec	Conflicting Volume (vph)	Movement Capacity (vph)	Delay (secs.)	LOS
SB - Left	1	3	3	33	1653	2.18	A
NB - Left	4	0	0	11	1694	2.13	A

WHOLE INTERSECTION	1.26	A
DELAYED MOVEMENTS	3.18	A

C A P S S I

COMPREHENSIVE ANALYSIS PROGRAM

FOR A SINGLE SIGNALIZED INTERSECTION *

04-19-95

Santa Clara County

A.M. Existing plus Approved

SOLUTION USING REQUIRED CYCLE TIME

FLN:5-e&aa

5. Monterey/Highland A.M Peak Hour Scenario 1

Movement	EBT	EBL	EBR	SBT	SBL	SBR	WBT	WBL	WBR	NBT	NBL	NBR
Phase 1 - 26 secs	.	X	X	.	.	.	.	.	.	.	.	.
Phase 2 - 10 secs	.	.	.	.	.	.	.	.	.	X	X	.
Phase 3 - 46 secs	.	.	.	X	.	X	.	.	.	X	.	.
Phase 4 - 0 secs	.	.	.	.	.	.	.	.	.	.	.	.
Phase 5 - 0 secs	.	.	.	.	.	.	.	.	.	.	.	.
Phase 6 - 0 secs	.	.	.	.	.	.	.	.	.	.	.	.

	EBT	EBL	EBR	SBT	SBL	SBR	WBT	WBL	WBR	NBT	NBL	NBR
Critical Mvmt-**			****	****							****	
Peak 15 Vol -vph		36	49	415		58				283	58	
Saturation -vph		1700	1800	3600		1800				3600	1700	
Lost time -sec		5.00	2.00	6.00		2.00				6.00	4.00	
Relative Sat 'X'		0.08	0.09	0.24		0.06				0.13	0.47	
Effective Gr-sec		21	24	40		44				50	6	
Move Time -sec		26	26	46		46				56	10	
Min/Ped Time-sec		5	26	26		26				15	4	
Prog Factor PAF		1.00	1.00	1.00		1.00				1.00	1.00	
AvDelay/veh -sec		18	16	9		7				5	30	
Level of Service		C+	C+	B+		B+				B+	D+	
Av.'Q'/ lane veh		1	1	2		1				1	1	
Veh Stopping %		76	73	58		48				42	96	
Do Veh Clear ?		YES	YES	YES		YES				YES	YES	

Whole Intersection - Weighted Av Delay (sec) = 10 Level of Service = B+

Critical Movements - Weighted Av Delay (sec) = 12 Level of Service = B-

'' '' - Intersection Capacity Utilization (ICU) = 0.21

Required Cycle Length is 82 seconds (All Minimum times are satisfied)

* CAPSSI (Release 11) - Based on Delay Methodology Per 1985 Highway Capacity Manual

C A P S S I

COMPREHENSIVE ANALYSIS PROGRAM

FOR A SINGLE SIGNALIZED INTERSECTION *

04-19-95

Santa Clara County

P.M. Existing plus Approved

SOLUTION USING REQUIRED CYCLE TIME

FLN:5-e&ap

5. Monterey/Highland   P.M Peak Hour   Scenario 1

Movement	EBT	EBL	EBR	SBT	SBL	SBR	WBT	WBL	WBR	NBT	NBL	NBR
Phase 1 - 8 secs	.	X	X	.	.	.	.	.	.	.	.	.
Phase 2 - 7 secs	.	.	.	.	.	.	.	.	.	X	X	.
Phase 3 - 26 secs	.	.	.	X	.	X	.	.	.	X	.	.
Phase 4 - 0 secs	.	.	.	.	.	.	.	.	.	.	.	.
Phase 5 - 0 secs	.	.	.	.	.	.	.	.	.	.	.	.
Phase 6 - 0 secs	.	.	.	.	.	.	.	.	.	.	.	.

	EBT	EBL	EBR	SBT	SBL	SBR	WBT	WBL	WBR	NBT	NBL	NBR
Critical Mvmt-**		****		****							****	
Peak 15 Vol -vph		63	52	515		58				463	54	
Saturation -vph		1700	1800	3600		1800				3600	1700	
Lost time -sec		5.00	2.00	6.00		2.00				6.00	4.00	
Relative Sat 'X'		0.51	0.20	0.29		0.06				0.20	0.43	
Effective Gr-sec		3	6	20		24				27	3	
Move Time -sec		8	8	26		26				33	7	
Min/Ped Time-sec		5	26	26		26				15	4	
Prog Factor PAF		1.00	1.00	1.00		1.00				1.00	1.00	
AvDelay/veh -sec		17	12	5		3				2	15	
Level of Service		C+	B-	A		A				A	C+	
Av.'Q'/ lane veh		1	1	2		0				1	1	
Veh Stopping %		96	88	60		43				39	96	
Do Veh Clear ?		YES	YES	YES		YES				YES	YES	

Whole Intersection - Weighted Av Delay (sec) = 5 Level of Service = B+

Critical Movements - Weighted Av Delay (sec) = 7 Level of Service = B+

'' '' - Intersection Capacity Utilization (ICU) = 0.33

Required Cycle Length is 41 seconds (All Minimum times are satisfied)

* CAPSSI (Release 11) - Based on Delay Methodology Per 1985 Highway Capacity Manual

APPENDIX C

Golf Course Trip Generation: A Derivation

Discussion of Trip Generation

GOLF COURSE TRIP GENERATION: A DERIVATION

The standard resource for trip generation estimates is the Institute of Transportation Engineers' (ITE) *Trip Generation* (Fifth Edition, 1991). For golf courses, the trip generation is correlated with acres, holes, and employees. However, these measures may not be completely reliable (for example, trip generation for a variety of 18-hole golf courses varies substantially). Furthermore, the ITE rates are based predominantly on 18-hole municipal courses in suburban areas which tend to generate more trips than isolated, rural locations such as the proposed project.

To estimate the projected trip generation of the proposed facility, rates were derived based in part on information from Mr. Hunter Gridley of the Northern California Golf Association (NCGA). This information was obtained as part of a previous golf course traffic study. His experience is based on the operation of existing golf courses, including the Poppy Hills Golf Course at Pebble Beach. Data from a 1992 study of the proposed Marin Coast Golf Ranch in rural Marin County was also used in the derivation, as was information specific to the proposed project. All assumptions underlying the derivation are documented with the calculations below.

P.M. Peak Hour Derivation

The golf course related trips consist of three components: 1) Persons staying on-site in the guest accommodations, 2) Motorists travelling from off-site locations, and 3) Employee trips.

Golf Trip Origins

Information supplied by the project applicant as well as the prospective facility operator was used to estimate the on-site and off-site golf patron shares. It is expected that on average 78 percent of the guest rooms will be occupied and that the average number of persons per room will be 1.5. It is also anticipated that on average each guest will golf once per day (some will not golf at all while others will golf multiple times). These assumptions result in an estimate of 53 on-site golfers. Based on a 1992 traffic study for the Proposed Marin Coast Golf Ranch (TJKM, August 1992) it was assumed that the site will serve 150 golfers per day. Therefore, the 53 on-site golfers constitute 35 percent of the expected daily golfers, leaving 65 percent of the golfers with off-site trip origins.

Facility Golfer Capacity

An 18-hole course can be expected to start a golf foursome every ten minutes (6 per hour), resulting in 24 golfers starting per hour. It is assumed that golfers will leave the course at the same rate, resulting in a total of 48 golfer trips per hour. It is important to note that these trips include both arriving and departing trips.

Estimated Trip Generation

As discussed previously, 65 percent of all golfers have trip origins off-site. The application of this percentage to the 48 total golfer trips results in 31 golfer trips during the p.m. peak hour with origins off-site. These 31 golfer trips are assumed to be made with an average vehicle occupancy of 1.5 persons. Thus, the total number of golf-related vehicles is 21. It was assumed that 11 of these vehicles arrive and 11 depart (an even in:out split).

According to Mr. Gridley, golf course employees typically arrive before 7:00 a.m. and leave after 6:00 p.m. Mr. Gridley estimated that, for a course with 50 employees working on a given day (similar to the proposed project staffing levels), an average of three employees travel to or from the site during each peak hour. He also stated that service and delivery vehicles rarely arrive during the peak hours. Thus, with the addition of three employee trips to the golfer trips, the total golf course vehicular trip generation is 25 p.m. peak hour trips.

A.M. Peak Hour Derivation

The a.m. peak hour derivation is similar to the p.m. derivation except that it was assumed that no golfers will finish the 18-hole course during the a.m. peak hour. Therefore, the number of golfer trips into the site remains 11 while the golfer trips out of the site drops to 7. With the addition of 3 inbound employee trips, the total reaches 21 trips.

Conclusion

The absolute number of trips derived above can be divided by the number of holes proposed for the site to obtain a rate per hole. This calculation reveals an a.m. peak hour rate of 1.39 per hole and a p.m. peak hour rate of 1.17 per hole. While these rates are lower than the standard ITE rates, they are slightly conservative in relation to two recent rural golf course studies conducted by TJKM (for the proposed Poppy Ridge Golf Course in Alameda County and the proposed Marin Coast Golf Ranch in Marin County).

APPENDIX D

Results of the Intersection Analysis
Existing plus Approved plus Project Conditions

```
LOS Software by TJKM Transportation Consultants
=========================================================================
Condition: A.M. EXISTING + APPROVED + PROJECT                    11/16/95
=========================================================================
INTERSECTION      1 SUNNYSIDE AVE/WATSONVILLE           SANTA CLARA COUNTY
Count Date                    Time                Peak Hour 7:15- 8:15AM
-------------------------------------------------------------------------
TRB All-Way STOP      RIGHT THRU LEFT
----------------         21  106   14
                          |   |    |
              ^           |   |    |         ^
              |        <---   v    --->      |
LEFT     32 ---   1.1   1.1  1.1  1.1   1.1 ---    23  RIGHT

THRU    194 ---> 1.1   (NO. OF LANES)   1.1<---    75  THRU

RIGHT    22 ---   1.0   1.1  1.1  1.1   1.1 ---    74  LEFT
              |        <---   ^    --->      |
              v           |   |    |         v                SIG WARRANTS:
  N                       |   |    |                          Urb=N, Rur=N
W + E                    12  118   83
  S                     LEFT THRU RIGHT
=========================================================================
RANGE CHECK VALUE                 MIN     MAX  | NB     SB     EB     WB
-----------------------------------------------+--------------------------
VOLUME PROPORTION                 0.20    0.50 | 0.27   0.18*  0.32   0.22
APPROACH LANES                    1       3    | 1      1      2      1
LEFT TURN PROPORTION              0.00    0.35 | 0.06   0.10   0.13   0.43*
RIGHT TURN PROPORTION             0.00    0.35 | 0.39*  0.15   0.09   0.13
-----------------------------------------------+--------------------------
* = VALUE LIES OUTSIDE VALID INPUT RANGE.  USE RESULTS WITH CAUTION.
===========================================================================
     ORIGINAL  PEAK HOUR FACTOR   ADJUSTED
APP  VOLUME     -LT- -TH- -RT-    VOLUME      CAPACITY   V/C    DELAY   LOS
--------------------------------------------------------------------------
NB     213     0.95 0.95 0.95      224          458     0.49     6.4     B
SB     141     0.95 0.95 0.95      149          491     0.30     3.2     A
EB     248     0.95 0.95 0.95      261          738     0.35     3.8     A
WB     172     0.95 0.95 0.95      181          490     0.37     4.1     A
==========================================================================
                                        DELAY=    4.5 SEC/VEH     LOS= A
==========================================================================
INT=142026EX.INT,VOL=142026EX.AMV+NHAYAP.AMV+HAY-PR.AMV,CAP=D:..LOSCAP
```

```
LOS Software by TJKM Transportation Consultants
=========================================================================
Condition: P.M. EXISTING + APPROVED + PROJECT                    11/16/95
=========================================================================
INTERSECTION      1 SUNNYSIDE AVE/WATSONVILLE           SANTA CLARA COUNTY
Count Date                    Time                Peak Hour 4:00- 5:00PM
-------------------------------------------------------------------------
TRB All-Way STOP      RIGHT THRU LEFT
----------------         56  121   35
                          |   |    |
              ^           |   |    |         ^
              |        <---   v    --->      |
LEFT     40 ---   1.1   1.1  1.1  1.1   1.1 ---    30  RIGHT

THRU    161 ---> 1.1   (NO. OF LANES)   1.1<---   181  THRU

RIGHT    16 ---   1.0   1.1  1.1  1.1   1.1 ---    80  LEFT
              |        <---   ^    --->      |
              v           |   |    |         v                SIG WARRANTS:
  N                       |   |    |                          Urb=N, Rur=B
W + E                    18  108   93
  S                     LEFT THRU RIGHT
=========================================================================
RANGE CHECK VALUE                 MIN     MAX  | NB     SB     EB     WB
-----------------------------------------------+--------------------------
VOLUME PROPORTION                 0.20    0.50 | 0.23   0.23   0.23   0.31
APPROACH LANES                    1       3    | 1      1      2      1
LEFT TURN PROPORTION              0.00    0.35 | 0.08   0.17   0.18   0.27
RIGHT TURN PROPORTION             0.00    0.35 | 0.42*  0.26   0.07   0.10
-----------------------------------------------+--------------------------
* = VALUE LIES OUTSIDE VALID INPUT RANGE.  USE RESULTS WITH CAUTION.
===========================================================================
     ORIGINAL  PEAK HOUR FACTOR   ADJUSTED
APP  VOLUME     -LT- -TH- -RT-    VOLUME      CAPACITY   V/C    DELAY   LOS
--------------------------------------------------------------------------
NB     219     0.95 0.95 0.95      231          451     0.51     7.0     B
SB     212     0.95 0.95 0.95      223          506     0.44     5.3     B
EB     217     0.95 0.95 0.95      228          753     0.30     3.2     A
WB     291     0.95 0.95 0.95      307          498     0.62    10.4     C
==========================================================================
                                        DELAY=    6.8 SEC/VEH     LOS= B
==========================================================================
INT=142026EX.INT,VOL=142026EX.PMV+NHAYAP.PMV+HAY-PR.PMV,CAP=D:..LOSCAP
```

1994 Highway Capacity Manual Unsignalized Intersection Methodology

East/West Street: Coolidge Ave.
North/South Street: San Martin Ave.
Title: Existing + Approved + Project (A.M.)

2-WAY STOP CONTROL

The North/South street is the major street.

		Southbound Right	Southbound Through	Southbound Left		
Volume		0	159	38		Volume
	Lanes	0	1	0	Lanes	
Eastbound Left 0	0	1 indicates an exclusive lane			0	22 Westbound Right
Eastbound Through 7	1	for right and left turns. Zero			1	3 Westbound Through
Eastbound Right 1	0	indicates a shared lane.			0	33 Westbound Left
	Lanes	0	1	0	Lanes	
Volume		0	106	38		Volume
		Northbound Left	Northbound Through	Northbound Right		

Peak Hour Factor (default = 1.00): 0.90
Pass. Car Equiv. factor (default = 1.1)

Turning Movement		Volume (vph) Actual	Adjustec	Conflicting Volume (vph)	Movement Capacity (vph)	Delay (secs.)	LOS
Shared	9	1					
EB - TRL	8	7	10	379	694	5.26	B
Shared	7	0					

Turning Movement		Volume (vph) Actual	Adjustec	Conflicting Volume (vph)	Movement Capacity (vph)	Delay (secs.)	LOS
Shared	12	22					
WB - TRL	11	3	70	358	763	5.20	B
Shared	10	33					

Turning Movement		Volume (vph) Actual	Adjustec	Conflicting Volume (vph)	Movement Capacity (vph)	Delay (secs.)	LOS
Shared	1	38	46	160	1438	2.59	A
Shared	4	0	0	177	1412	2.55	A

WHOLE INTERSECTION	1.20	A
DELAYED MOVEMENTS	4.25	A

1994 Highway Capacity Manual Unsignalized Intersection Methodology

East/West Street: Coolidge Ave.
North/South Street: San Martin Ave.
Title: Existing + Approved + Project (P.M.)

2-WAY STOP CONTROL

The North/South street is the major street.

			Southbound Right	Southbound Through	Southbound Left			
	Volume		2	165	39		Volume	
		Lanes	0	1	0	Lanes		
Eastbound Left	1	0	1 indicates an exclusive lane			0	27	Right Westbound
Eastbound Through	2	1	for right and left turns. Zero			1	5	Through Westbound
Eastbound Right	4	0	indicates a shared lane.			0	57	Left Westbound
		Lanes	0	1	0	Lanes		
	Volume		3	196	52		Volume	
			Northbound Left	Northbound Through	Northbound Right			

Peak Hour Factor (default = 1.00):	0.90
Pass. Car Equiv. factor (default = 1.1)	

Turning Movement		Volume (vph) Actual	Volume (vph) Adjusted	Conflicting Volume (vph)	Movement Capacity (vph)	Delay (secs.)	LOS
Shared	9	4					
EB - TRL	8	2	7	506	771	4.71	A
Shared	7	1					

Turning Movement		Volume (vph) Actual	Volume (vph) Adjusted	Conflicting Volume (vph)	Movement Capacity (vph)	Delay (secs.)	LOS
Shared	12	27					
WB - TRL	11	5	109	478	632	6.88	B
Shared	10	57					

Turning Movement		Volume (vph) Actual	Volume (vph) Adjusted	Conflicting Volume (vph)	Movement Capacity (vph)	Delay (secs.)	LOS
Shared	1	39	47	276	1266	2.95	A
Shared	4	3	3	185	1399	2.58	A

WHOLE INTERSECTION	1.53	A
DELAYED MOVEMENTS	5.60	B

C A P S S I
COMPREHENSIVE ANALYSIS PROGRAM
FOR A SINGLE SIGNALIZED INTERSECTION *

11-16-95

Santa Clara County
EXISTING + APPROVED + PROJECT
SOLUTION USING REQUIRED CYCLE TIME

FLN:3eap_a

3. Monterey/San Martin — A.M Peak Hour — Scenario 1

Movement	EBT	EBL	EBR	SBT	SBL	SBR	WBT	WBL	WBR	NBT	NBL	NBR
Phase 1 - 28 secs	X	X	X	.	.	.	X	X	X	.	.	.
Phase 2 - 5 secs	.	.	.	.	X	.	.	.	.	.	X	.
Phase 3 - 6 secs	.	.	.	X	X	X	.	.	.	.	.	.
Phase 4 - 26 secs	.	.	.	X	.	X	.	.	.	X	.	X
Phase 5 - 0 secs	.	.	.	.	.	.	.	.	.	.	.	.
Phase 6 - 0 secs	.	.	.	.	.	.	.	.	.	.	.	.

	EBT	EBL	EBR	SBT	SBL	SBR	WBT	WBL	WBR	NBT	NBL	NBR
Critical Mvmt-**					****		****			****		
Peak 15 Vol -vph	75	19	10	343	113	18	42	165	116	226	10	83
Saturation -vph	1200	Shrd	1800	3600	1700	1800	1300	Shrd	Shrd	3600	1700	Shrd
Lost time -sec	4.00	-	2.00	6.00	4.00	2.00	4.00	-	-	6.00	2.00	-
Relative Sat 'X'	0.21	-	0.01	0.24	0.62	0.02	0.67	-	-	0.28	0.13	-
Effective Gr-sec	24	-	26	26	7	30	24	-	-	20	3	-
Move Time -sec	28	-	28	32	11	32	28	-	-	26	5	-
Min/Ped Time-sec	26	-	26	26	4	26	26	-	-	26	4	-
Prog Factor PAF	1.00	-	1.00	1.00	1.00	1.00	1.00	-	-	1.00	1.00	-
AvDelay/veh -sec	11	-	9	10	25	7	16	-	-	13	23	-
Level of Service	B-	-	B+	B+	D+	B+	C+	-	-	B-	C-	-
Av.'Q'/ lane veh	1	-	0	2	2	0	4	-	-	2	0	-
Veh Stopping %	68	-	60	66	96	54	84	-	-	76	96	-
Do Veh Clear ?	YES	-	YES	YES	YES	YES	YES	-	-	YES	YES	-

Whole Intersection - Weighted Av Delay (sec) = 14 Level of Service = B-
Critical Movements - Weighted Av Delay (sec) = 16 Level of Service = C+
'' '' - Intersection Capacity Utilization (ICU) = 0.51

Required Cycle Length is 65 seconds (All Minimum times are satisfied)

* CAPSSI (Release 11) - Based on Delay Methodology Per 1985 Highway Capacity Manual

C A P S S I
COMPREHENSIVE ANALYSIS PROGRAM
FOR A SINGLE SIGNALIZED INTERSECTION *

11-16-95

Santa Clara County
EXISTING + APPROVED + PROJECT
SOLUTION USING REQUIRED CYCLE TIME

FLN:3eap_p

3. Monterey/San Martin — P.M Peak Hour — Scenario 1

Movement	EBT	EBL	EBR	SBT	SBL	SBR	WBT	WBL	WBR	NBT	NBL	NBR
Phase 1 - 42 secs	X	X	X	.	.	.	X	X	X	.	.	.
Phase 2 - 5 secs	.	.	.	.	X	.	.	.	.	.	X	.
Phase 3 - 13 secs	.	.	.	X	X	X	.	.	.	.	.	.
Phase 4 - 26 secs	.	.	.	X	.	X	.	.	.	X	.	X
Phase 5 - 0 secs	.	.	.	.	.	.	.	.	.	.	.	.
Phase 6 - 0 secs	.	.	.	.	.	.	.	.	.	.	.	.
Critical Mvmt-**					****		****			****		
Peak 15 Vol -vph	83	16	15	503	216	40	79	170	247	414	12	183
Saturation -vph	1000	Shrd	1800	3600	1700	1800	1300	Shrd	Shrd	3600	1700	Shrd
Lost time -sec	4.00	-	2.00	6.00	4.00	2.00	4.00	-	-	6.00	4.00	-
Relative Sat 'X'	0.22	-	0.02	0.36	0.78	0.05	0.86	-	-	0.71	0.61	-
Effective Gr-sec	38	-	40	33	14	37	38	-	-	20	1	-
Move Time -sec	42	-	42	39	18	39	42	-	-	26	5	-
Min/Ped Time-sec	26	-	26	26	4	26	26	-	-	26	4	-
Prog Factor PAF	1.00	-	1.00	1.00	1.00	1.00	1.00	-	-	1.00	1.00	-
AvDelay/veh -sec	11	-	9	15	35	11	26	-	-	25	58	-
Level of Service	B-	-	B+	B-	D-	B-	D+	-	-	D+	E-	-
Av.'Q'/ lane veh	1	-	0	4	4	1	7	-	-	5	0	-
Veh Stopping %	62	-	54	72	96	58	90	-	-	92	100	-
Do Veh Clear ?	YES	-	YES	YES	YES	YES	YES	-	-	YES	YES	-

Whole Intersection - Weighted Av Delay (sec) = 23 Level of Service = C-
Critical Movements - Weighted Av Delay (sec) = 27 Level of Service = D+
'' '' - Intersection Capacity Utilization (ICU) = 0.81

Required Cycle Length is 86 seconds (All Minimum times are satisfied)

* CAPSSI (Release 11) - Based on Delay Methodology Per 1985 Highway Capacity Manual

1994 Highway Capacity Manual Unsignalized Intersection Methodology

East/West Street: Highland
North/South Street: Santa Teresa
Title: Existing + Approved + Project (A.M.)

2-WAY STOP CONTROL

The North/South street is the major street.

			Southbound Right	Southbound Through	Southbound Left			
	Volume		9	158	26		**Volume**	
		Lanes	0	1	1	**Lanes**		
Eastbound Left	11	0	1 indicates an exclusive lane			0	7	Right Westbound
Eastbound Through	21	1	for right and left turns. Zero			1	18	Through Westbound
Eastbound Right	9	0	indicates a shared lane.			0	14	Left Westbound
		Lanes	1	1	0	**Lanes**		
	Volume		6	130	16		**Volume**	
			Northbound Left	Northbound Through	Northbound Right			

Peak Hour Factor (default = 1.00): 0.90
Pass. Car Equiv. factor (default = 1.1)

Turning Movement		Volume (vph) Actual	Volume (vph) Adjustec	Conflicting Volume (vph)	Movement Capacity (vph)	Delay (secs.)	LOS
Shared	9	9					
EB - TRL	8	21	49	379	713	5.42	B
Shared	7	11					

Turning Movement		Volume (vph) Actual	Volume (vph) Adjustec	Conflicting Volume (vph)	Movement Capacity (vph)	Delay (secs.)	LOS
Shared	12	7					
WB - TRL	11	18	49	375	694	5.59	B
Shared	10	14					

Turning Movement		Volume (vph) Actual	Volume (vph) Adjustec	Conflicting Volume (vph)	Movement Capacity (vph)	Delay (secs.)	LOS
SB - Left	1	26	32	162	1435	2.57	A
NB - Left	4	6	8	186	1398	2.59	A

WHOLE INTERSECTION	1.37	A
DELAYED MOVEMENTS	4.65	A

1994 Highway Capacity Manual Unsignalized Intersection Methodology

East/West Street: Highland

North/South Street: Santa Teresa

Title: Existing + Approved + Project (P.M.)

2-WAY STOP CONTROL

The North/South street is the major street.

		Southbound Right	Southbound Through	Southbound Left			
Volume		17	188	14		Volume	
	Lanes	0	1	1	Lanes		
Eastbound Left 13	0	1 indicates an exclusive lane			0	13	Right
Eastbound Through 26	1	for right and left turns. Zero			1	36	Through Westbound
Eastbound Right 14	0	indicates a shared lane.			0	26	Left
	Lanes	1	1	0	Lanes		
Volume		13	220	15		Volume	
		Left	Through	Right			
			Northbound				

Peak Hour Factor (default = 1.00): 0.90

Pass. Car Equiv. factor (default = 1.1)

Turning Movement		Volume (vph) Actual	Adjustec	Conflicting Volume (vph)	Movement Capacity (vph)	Delay (secs.)	LOS
Shared	9	14					
EB - TRL	8	26	65	510	625	6.43	B
Shared	7	13					

Turning Movement		Volume (vph) Actual	Adjustec	Conflicting Volume (vph)	Movement Capacity (vph)	Delay (secs.)	LOS
Shared	12	13					
WB - TRL	11	36	91	511	579	7.37	B
Shared	10	26					

Turning Movement		Volume (vph) Actual	Adjustec	Conflicting Volume (vph)	Movement Capacity (vph)	Delay (secs.)	LOS
SB - Left	1	14	18	261	1287	2.84	A
NB - Left	4	13	15	228	1335	2.73	A

WHOLE INTERSECTION	1.80	A
DELAYED MOVEMENTS	6.24	B

C A P S S I
COMPREHENSIVE ANALYSIS PROGRAM
FOR A SINGLE SIGNALIZED INTERSECTION *

11-16-95

Santa Clara County
EXISTING + APPROVED + PROJECT
SOLUTION USING REQUIRED CYCLE TIME

5. Monterey/Highland

A.M Peak Hour

FLN:5eap_a
Scenario 1

Movement	EBT	EBL	EBR	SBT	SBL	SBR	WBT	WBL	WBR	NBT	NBL	NBR
Phase 1 - 8 secs	.	X	X	.	.	.	.	.	.	.	.	.
Phase 2 - 7 secs	.	.	.	.	.	.	.	.	.	X	X	.
Phase 3 - 26 secs	.	.	.	X	.	X	.	.	.	X	.	.
Phase 4 - 0 secs	.	.	.	.	.	.	.	.	.	.	.	.
Phase 5 - 0 secs	.	.	.	.	.	.	.	.	.	.	.	.
Phase 6 - 0 secs	.	.	.	.	.	.	.	.	.	.	.	.
Critical Mvmt-**		****		****							****	
Peak 15 Vol -vph		50	52	415		70				283	61	
Saturation -vph		1700	1800	3600		1800				3600	1700	
Lost time -sec		5.00	2.00	6.00		2.00				6.00	4.00	
Relative Sat 'X'		0.40	0.20	0.24		0.07				0.12	0.49	
Effective Gr-sec		3	6	20		24				27	3	
Move Time -sec		8	8	26		26				33	7	
Min/Ped Time-sec		5	10	26		26				15	4	
Prog Factor PAF		1.00	1.00	1.00		1.00				1.00	1.00	
AvDelay/veh -sec		15	12	5		3				2	16	
Level of Service		B-	B-	A		A				A	C+	
Av.'Q'/ lane veh		1	1	1		0				1	1	
Veh Stopping %		95	88	58		43				37	96	
Do Veh Clear ?		YES	YES	YES		YES				YES	YES	

Whole Intersection - Weighted Av Delay (sec) = 5 Level of Service = B+
Critical Movements - Weighted Av Delay (sec) = 7 Level of Service = B+
'' '' - Intersection Capacity Utilization (ICU) = 0.28

Required Cycle Length is 41 seconds (All Minimum times are satisfied)

* CAPSSI (Release 11) - Based on Delay Methodology Per 1985 Highway Capacity Manual

C A P S S I
COMPREHENSIVE ANALYSIS PROGRAM
FOR A SINGLE SIGNALIZED INTERSECTION *

11-16-95

Santa Clara County
EXISTING + APPROVED + PROJECT
SOLUTION USING REQUIRED CYCLE TIME

5. Monterey/Highland

P.M Peak Hour

FLN:5eap_p
Scenario 1

Movement	EBT	EBL	EBR	SBT	SBL	SBR	WBT	WBL	WBR	NBT	NBL	NBR
Phase 1 - 9 secs	.	X	X	.	.	.	.	.	.	.	.	.
Phase 2 - 7 secs	.	.	.	.	.	.	.	.	.	X	X	.
Phase 3 - 26 secs	.	.	.	X	.	X	.	.	.	X	.	.
Phase 4 - 0 secs	.	.	.	.	.	.	.	.	.	.	.	.
Phase 5 - 0 secs	.	.	.	.	.	.	.	.	.	.	.	.
Phase 6 - 0 secs	.	.	.	.	.	.	.	.	.	.	.	.
Critical Mvmt-**		****		****							****	
Peak 15 Vol -vph		81	56	515		83				463	60	
Saturation -vph		1700	1800	3600		1800				3600	1700	
Lost time -sec		5.00	2.00	6.00		2.00				6.00	4.00	
Relative Sat 'X'		0.50	0.19	0.30		0.08				0.20	0.49	
Effective Gr-sec		4	7	20		24				27	3	
Move Time -sec		9	9	26		26				33	7	
Min/Ped Time-sec		5	10	26		26				15	4	
Prog Factor PAF		1.00	1.00	1.00		1.00				1.00	1.00	
AvDelay/veh -sec		16	11	5		3				2	17	
Level of Service		C+	B-	B+		A				A	C+	
Av.'Q'/ lane veh		1	1	2		0				1	1	
Veh Stopping %		95	86	61		45				41	96	
Do Veh Clear ?		YES	YES	YES		YES				YES	YES	

Whole Intersection - Weighted Av Delay (sec) = 5 Level of Service = B+
Critical Movements - Weighted Av Delay (sec) = 8 Level of Service = B+
'' '' - Intersection Capacity Utilization (ICU) = 0.35

Required Cycle Length is 42 seconds (All Minimum times are satisfied)

* CAPSSI (Release 11) - Based on Delay Methodology Per 1985 Highway Capacity Manual

APPENDIX E

Results of the Intersection Analysis
Existing plus Approved plus
Project plus Expected Growth Conditions

```
LOS Software by TJKM Transportation Consultants
=========================================================================
Condition: A.M. EX. + APP. + PROJ. + EXPECTED GROWTH            11/16/95
=========================================================================
INTERSECTION     1 SUNNYSIDE AVE/WATSONVILLE          SANTA CLARA COUNTY
Count Date                 Time                Peak Hour
-------------------------------------------------------------------------
TRB All-Way STOP       RIGHT THRU LEFT
----------------          22  109   14
                           |    |    |
                ^          |    |    |        ^
                |       <---    v    --->     |
LEFT     33 ---    1.1    1.1  1.1  1.1    1.1 ---    24  RIGHT

THRU    201 ---> 1.1    (NO. OF LANES)     1.1<---    77  THRU

RIGHT    23 ---    1.0    1.1  1.1  1.1    1.1 ---    76  LEFT
                |       <---    ^    --->     |
                v          |    |    |        v                SIG WARRANTS:
  N                        |    |    |                           Urb=N, Rur=N
W + E                     12  122   85
  S                     LEFT THRU RIGHT
=========================================================================
RANGE CHECK VALUE                MIN    MAX  |  NB    SB     EB    WB
-------------------------------------------+-----------------------------
VOLUME PROPORTION               0.20   0.50 | 0.27  0.18*  0.32  0.22
APPROACH LANES                  1      3    | 1     1      2     1
LEFT TURN PROPORTION            0.00   0.35 | 0.06  0.10   0.13  0.43*
RIGHT TURN PROPORTION           0.00   0.35 | 0.39* 0.15   0.09  0.13
-------------------------------------------+-----------------------------
* = VALUE LIES OUTSIDE VALID INPUT RANGE.  USE RESULTS WITH CAUTION.
=========================================================================
    ORIGINAL  PEAK HOUR FACTOR   ADJUSTED
APP VOLUME     -LT- -TH- -RT-    VOLUME     CAPACITY   V/C   DELAY   LOS
-------------------------------------------------------------------------
NB    219      0.95 0.95 0.95      230         459     0.50   6.7     B
SB    145      0.95 0.95 0.95      153         491     0.31   3.3     A
EB    257      0.95 0.95 0.95      271         741     0.37   4.0     A
WB    177      0.95 0.95 0.95      186         492     0.38   4.2     A
=========================================================================
                                         DELAY=   4.7 SEC/VEH   LOS= A
=========================================================================
INT=142026EX.INT,VOL=HAY-EG.AMV+NHAYAP.AMV+HAY-PR.AMV,CAP=D:..LOSCAP.T
```

```
LOS Software by TJKM Transportation Consultants
=========================================================================
Condition: P.M. EX. + APP. + PROJ. + EXPECTED GROWTH            11/16/95
=========================================================================
INTERSECTION     1 SUNNYSIDE AVE/WATSONVILLE          SANTA CLARA COUNTY
Count Date                 Time                Peak Hour
-------------------------------------------------------------------------
TRB All-Way STOP       RIGHT THRU LEFT
----------------          58  125   36
                           |    |    |
                ^          |    |    |        ^
                |       <---    v    --->     |
LEFT     41 ---    1.1    1.1  1.1  1.1    1.1 ---    31  RIGHT

THRU    166 ---> 1.1    (NO. OF LANES)     1.1<---   187  THRU

RIGHT    17 ---    1.0    1.1  1.1  1.1    1.1 ---    82  LEFT
                |       <---    ^    --->     |
                v          |    |    |        v                SIG WARRANTS:
  N                        |    |    |                           Urb=N, Rur=Y
W + E                     19  111   95
  S                     LEFT THRU RIGHT
=========================================================================
RANGE CHECK VALUE                MIN    MAX  |  NB    SB     EB    WB
-------------------------------------------+-----------------------------
VOLUME PROPORTION               0.20   0.50 | 0.23  0.23   0.23  0.31
APPROACH LANES                  1      3    | 1     1      2     1
LEFT TURN PROPORTION            0.00   0.35 | 0.08  0.16   0.18  0.27
RIGHT TURN PROPORTION           0.00   0.35 | 0.42* 0.26   0.08  0.10
-------------------------------------------+-----------------------------
* = VALUE LIES OUTSIDE VALID INPUT RANGE.  USE RESULTS WITH CAUTION.
=========================================================================
    ORIGINAL  PEAK HOUR FACTOR   ADJUSTED
APP VOLUME     -LT- -TH- -RT-    VOLUME     CAPACITY   V/C   DELAY   LOS
-------------------------------------------------------------------------
NB    225      0.95 0.95 0.95      237         452     0.52   7.3     B
SB    219      0.95 0.95 0.95      231         506     0.46   5.7     B
EB    224      0.95 0.95 0.95      236         754     0.31   3.3     A
WB    300      0.95 0.95 0.95      316         498     0.63  11.1     C
=========================================================================
                                         DELAY=   7.2 SEC/VEH   LOS= B
=========================================================================
INT=142026EX.INT,VOL=HAY-EG.PMV+NHAYAP.PMV+HAY-PR.PMV,CAP=D:..LOSCAP.T
```

1994 Highway Capacity Manual Unsignalized Intersection Methodology

East/West Street: Coolidge Ave.

North/South Street: San Martin Ave.

Title: Ex. + App. + Proj. + Expected Growth (A.M.)

2-WAY STOP CONTROL

The North/South street is the major street.

			Southbound Right	Southbound Through	Southbound Left			
	Volume		0	163	39		Volume	
		Lanes	0	1	0	Lanes		
Eastbound Left	0	0	1 indicates an exclusive lane			0	23	Westbound Right
Eastbound Through	7	1	for right and left turns. Zero			1	3	Westbound Through
Eastbound Right	1	0	indicates a shared lane.			0	34	Westbound Left
		Lanes	0	1	0	Lanes		
	Volume		0	109	39		Volume	
			Northbound Left	Northbound Through	Northbound Right			

Peak Hour Factor (default = 1.00): 0.90

Pass. Car Equiv. factor (default = 1.1)

Turning Movement		Volume (vph) Actual	Adjustec	Conflicting Volume (vph)	Movement Capacity (vph)	Delay (secs.)	LOS
Shared	9	1					
EB - TRL	8	7	10	388	686	5.32	B
Shared	7	0					

Turning Movement		Volume (vph) Actual	Adjustec	Conflicting Volume (vph)	Movement Capacity (vph)	Delay (secs.)	LOS
Shared	12	23					
WB - TRL	11	3	74	367	764	5.22	B
Shared	10	34					

Turning Movement		Volume (vph) Actual	Adjustec	Conflicting Volume (vph)	Movement Capacity (vph)	Delay (secs.)	LOS
Shared	1	39	47	164	1432	2.60	A
Shared	4	0	0	181	1406	2.56	A

WHOLE INTERSECTION	1.22	A
DELAYED MOVEMENTS	4.29	A

1994 Highway Capacity Manual Unsignalized Intersection Methodology

East/West Street: Coolidge Ave.
North/South Street: San Martin Ave.
Title: Ex. + App. + Proj. + Expected Growth (P.M.)

2-WAY STOP CONTROL

The North/South street is the major street.

			Southbound Right	Southbound Through	Southbound Left			
	Volume		2	170	40		Volume	
		Lanes	0	1	0	Lanes		
Eastbound Left	1	0	1 indicates an exclusive lane			0	28	Right Westbound
Eastbound Through	2	1	for right and left turns. Zero			1	5	Through Westbound
Eastbound Right	4	0	indicates a shared lane.			0	59	Left Westbound
		Lanes	0	1	0	Lanes		
	Volume		3	202	54		Volume	
			Northbound Left	Northbound Through	Northbound Right			

Peak Hour Factor (default = 1.00): 0.90
Pass. Car Equiv. factor (default = 1.1)

Turning Movement		Volume (vph) Actual	Volume (vph) Adjustec	Conflicting Volume (vph)	Movement Capacity (vph)	Delay (secs.)	LOS
Shared	9	4					
EB - TRL	8	2	7	521	759	4.79	A
Shared	7	1					

Turning Movement		Volume (vph) Actual	Volume (vph) Adjustec	Conflicting Volume (vph)	Movement Capacity (vph)	Delay (secs.)	LOS
Shared	12	28					
WB - TRL	11	5	114	492	619	7.12	B
Shared	10	59					

Turning Movement		Volume (vph) Actual	Volume (vph) Adjustec	Conflicting Volume (vph)	Movement Capacity (vph)	Delay (secs.)	LOS
Shared	1	40	48	284	1255	2.98	A
Shared	4	3	3	191	1390	2.60	A

WHOLE INTERSECTION	1.59	A
DELAYED MOVEMENTS	5.79	B

CAPSSI
COMPREHENSIVE ANALYSIS PROGRAM
FOR A SINGLE SIGNALIZED INTERSECTION *

11-16-95

Santa Clara County
EX + AP + PR + EXPECTED GROWTH
SOLUTION USING REQUIRED CYCLE TIME

3. Monterey/San Martin — A.M Peak Hour — FLN:3eg_a Scenario 1

Movement	EBT	EBL	EBR	SBT	SBL	SBR	WBT	WBL	WBR	NBT	NBL	NBR
Phase 1 - 29 secs	X	X	X	.	.	.	X	X	X	.	.	.
Phase 2 - 5 secs	.	.	.	.	X	.	.	.	.	.	X	.
Phase 3 - 6 secs	.	.	.	X	X	X	.	.	.	.	.	.
Phase 4 - 26 secs	.	.	.	X	.	X	.	.	.	X	.	X
Phase 5 - 0 secs	.	.	.	.	.	.	.	.	.	.	.	.
Phase 6 - 0 secs	.	.	.	.	.	.	.	.	.	.	.	.

	EBT	EBL	EBR	SBT	SBL	SBR	WBT	WBL	WBR	NBT	NBL	NBR
Critical Mvmt-**					****		****			****		
Peak 15 Vol -vph	78	20	10	351	115	19	43	178	119	233	10	85
Saturation -vph	1200	Shrd	1800	3600	1700	1800	1300	Shrd	Shrd	3600	1700	Shrd
Lost time -sec	4.00	-	2.00	6.00	4.00	2.00	4.00	-	-	6.00	2.00	-
Relative Sat 'X'	0.22	-	0.01	0.25	0.64	0.02	0.69	-	-	0.29	0.13	-
Effective Gr-sec	25	-	27	26	7	30	25	-	-	20	3	-
Move Time -sec	29	-	29	32	11	32	29	-	-	26	5	-
Min/Ped Time-sec	26	-	26	26	4	26	26	-	-	26	4	-
Prog Factor PAF	1.00	-	1.00	1.00	1.00	1.00	1.00	-	-	1.00	1.00	-
AvDelay/veh -sec	11	-	9	10	27	8	16	-	-	13	23	-
Level of Service	B-	-	B+	B-	D+	B+	C+	-	-	B-	C-	-
Av.'Q'/ lane veh	1	-	0	2	2	0	4	-	-	2	0	-
Veh Stopping %	68	-	59	67	96	55	84	-	-	76	96	-
Do Veh Clear ?	YES	-	YES	YES	YES	YES	YES	-	-	YES	YES	-

Whole Intersection - Weighted Av Delay (sec) = 14 Level of Service = B-
Critical Movements - Weighted Av Delay (sec) = 16 Level of Service = C+
'' '' - Intersection Capacity Utilization (ICU) = 0.53

Required Cycle Length is 66 seconds (All Minimum times are satisfied)

* CAPSSI (Release 11) - Based on Delay Methodology Per 1985 Highway Capacity Manual

11-16-95

C A P S S I
COMPREHENSIVE ANALYSIS PROGRAM
FOR A SINGLE SIGNALIZED INTERSECTION *

Santa Clara County
EX + AP + PR + EXPECTED GROWTH
SOLUTION USING REQUIRED CYCLE TIME

FLN:3eg_p

3. Monterey/San Martin — P.M Peak Hour — Scenario 1

Movement	EBT	EBL	EBR	SBT	SBL	SBR	WBT	WBL	WBR	NBT	NBL	NBR
Phase 1 - 43 secs	X	X	X	.	.	.	X	X	X	.	.	.
Phase 2 - 5 secs	.	.	.	.	X	.	.	.	.	.	X	.
Phase 3 - 13 secs	.	.	.	X	X	X	.	.	.	.	.	.
Phase 4 - 26 secs	.	.	.	X	.	X	.	.	.	X	.	X
Phase 5 - 0 secs	.	.	.	.	.	.	.	.	.	.	.	.
Phase 6 - 0 secs	.	.	.	.	.	.	.	.	.	.	.	.

	EBT	EBL	EBR	SBT	SBL	SBR	WBT	WBL	WBR	NBT	NBL	NBR
Critical Mvmt-**					****		****			****		
Peak 15 Vol -vph	86	17	16	519	222	41	82	175	253	426	12	188
Saturation -vph	1000	Shrd	1800	3600	1700	1800	1300	Shrd	Shrd	3600	1700	Shrd
Lost time -sec	4.00	-	2.00	6.00	4.00	2.00	4.00	-	-	6.00	4.00	-
Relative Sat 'X'	0.23	-	0.02	0.38	0.81	0.05	0.88	-	-	0.74	0.61	-
Effective Gr-sec	39	-	41	33	14	37	39	-	-	20	1	-
Move Time -sec	43	-	43	39	18	39	43	-	-	26	5	-
Min/Ped Time-sec	26	-	26	26	4	26	26	-	-	26	4	-
Prog Factor PAF	1.00	-	1.00	1.00	1.00	1.00	1.00	-	-	1.00	1.00	-
AvDelay/veh -sec	11	-	9	15	38	11	26	-	-	26	60	-
Level of Service	B-	-	B+	B-	D-	B-	D+	-	-	D+	F	-
Av.'Q'/ lane veh	1	-	0	4	5	1	7	-	-	6	0	-
Veh Stopping %	62	-	53	73	97	59	91	-	-	93	100	-
Do Veh Clear ?	YES	-	YES	YES	YES	YES	YES	-	-	YES	YES	-

Whole Intersection - Weighted Av Delay (sec) = 24 Level of Service = C-
Critical Movements - Weighted Av Delay (sec) = 28 Level of Service = D+
'' '' - Intersection Capacity Utilization (ICU) = 0.83

Required Cycle Length is 87 seconds (All Minimum times are satisfied)

* CAPSSI (Release 11) - Based on Delay Methodology Per 1985 Highway Capacity Manual

1994 Highway Capacity Manual Unsignalized Intersection Methodology

East/West Street: Highland

North/South Street: Santa Teresa

Title: Ex. + App. + Proj. + Expected Growth (A.M.)

2-WAY STOP CONTROL

The North/South street is the major street.

			Southbound				
		Right	Through	Left			
Volume		9	163	26		**Volume**	
	Lanes	0	1	1	**Lanes**		
Eastbound Left: 11	0	1 indicates an exclusive lane			0	7	Right
Eastbound Through: 21	1	for right and left turns. Zero			1	18	Through Westbound
Eastbound Right: 9	0	indicates a shared lane.			0	14	Left
	Lanes	1	1	0	**Lanes**		
Volume		6	135	16		**Volume**	
		Left	Through	Right			
			Northbound				

Peak Hour Factor (default = 1.00):	0.90
Pass. Car Equiv. factor (default = 1.1)	

Turning Movement		Volume (vph) Actual	Adjustec	Conflicting Volume (vph)	Movement Capacity (vph)	Delay (secs.)	LOS
Shared	9	9					
EB - TRL	8	21	49	390	704	5.50	B
Shared	7	11					

Turning Movement		Volume (vph) Actual	Adjustec	Conflicting Volume (vph)	Movement Capacity (vph)	Delay (secs.)	LOS
Shared	12	7					
WB - TRL	11	18	49	386	684	5.67	B
Shared	10	14					

Turning Movement		Volume (vph) Actual	Adjustec	Conflicting Volume (vph)	Movement Capacity (vph)	Delay (secs.)	LOS
SB - Left	1	26	32	168	1426	2.58	A
NB - Left	4	6	8	191	1390	2.60	A

WHOLE INTERSECTION	1.36	A
DELAYED MOVEMENTS	4.71	A

1994 Highway Capacity Manual Unsignalized Intersection Methodology

East/West Street: Highland

North/South Street: Santa Teresa

Title: Ex. + App. + Proj. + Expected Growth (P.M.)

2-WAY STOP CONTROL

The North/South street is the major street.

			Southbound Right	Southbound Through	Southbound Left			
	Volume		17	194	14		Volume	
		Lanes	0	1	1	Lanes		
Eastbound Left	13	0	1 indicates an exclusive lane			0	13	Right Westbound
Eastbound Through	26	1	for right and left turns. Zero			1	36	Through Westbound
Eastbound Right	14	0	indicates a shared lane.			0	27	Left Westbound
		Lanes	1	1	0	Lanes		
	Volume		13	227	15		Volume	
			Northbound Left	Northbound Through	Northbound Right			

Peak Hour Factor (default = 1.00):	0.90
Pass. Car Equiv. factor (default = 1.1)	

Turning Movement		Volume (vph) Actual	Adjustec	Conflicting Volume (vph)	Movement Capacity (vph)	Delay (secs.)	LOS
Shared	9	14					
EB - TRL	8	26	65	525	614	6.55	B
Shared	7	13					

Turning Movement		Volume (vph) Actual	Adjustec	Conflicting Volume (vph)	Movement Capacity (vph)	Delay (secs.)	LOS
Shared	12	13					
WB - TRL	11	36	92	526	567	7.57	B
Shared	10	27					

Turning Movement		Volume (vph) Actual	Adjustec	Conflicting Volume (vph)	Movement Capacity (vph)	Delay (secs.)	LOS
SB - Left	1	14	18	269	1276	2.86	A
NB - Left	4	13	15	235	1325	2.75	A

WHOLE INTERSECTION	1.81	A
DELAYED MOVEMENTS	6.39	B

CAPSSI
COMPREHENSIVE ANALYSIS PROGRAM
FOR A SINGLE SIGNALIZED INTERSECTION *

11-16-95

Santa Clara County
EX + AP + PR + EXPECTED GROWTH
SOLUTION USING REQUIRED CYCLE TIME

FLN:5eg_a

5. Monterey/Highland A.M Peak Hour Scenario 1

Movement	EBT	EBL	EBR	SBT	SBL	SBR	WBT	WBL	WBR	NBT	NBL	NBR
Phase 1 - 8 secs	.	X	X	.	.	.	.	.	.	.	.	.
Phase 2 - 7 secs	.	.	.	.	.	.	.	.	.	X	X	.
Phase 3 - 26 secs	.	.	.	X	.	X	.	.	.	X	.	.
Phase 4 - 0 secs	.	.	.	.	.	.	.	.	.	.	.	.
Phase 5 - 0 secs	.	.	.	.	.	.	.	.	.	.	.	.
Phase 6 - 0 secs	.	.	.	.	.	.	.	.	.	.	.	.

	EBT	EBL	EBR	SBT	SBL	SBR	WBT	WBL	WBR	NBT	NBL	NBR
Critical Mvmt-**		****		****							****	
Peak 15 Vol -vph		51	53	423		72				292	63	
Saturation -vph		1700	1800	3600		1800				3600	1700	
Lost time -sec		5.00	2.00	6.00		2.00				6.00	4.00	
Relative Sat 'X'		0.41	0.20	0.24		0.07				0.12	0.51	
Effective Gr-sec		3	6	20		24				27	3	
Move Time -sec		8	8	26		26				33	7	
Min/Ped Time-sec		5	10	26		26				15	4	
Prog Factor PAF		1.00	1.00	1.00		1.00				1.00	1.00	
AvDelay/veh -sec		15	12	5		3				2	17	
Level of Service		C+	B-	A		A				A	C+	
Av.'Q'/ lane veh		1	1	1		0				1	1	
Veh Stopping %		96	88	58		43				37	96	
Do Veh Clear ?		YES	YES	YES		YES				YES	YES	

Whole Intersection - Weighted Av Delay (sec) = 5 Level of Service = B+
Critical Movements - Weighted Av Delay (sec) = 7 Level of Service = B+
'' '' - Intersection Capacity Utilization (ICU) = 0.29

Required Cycle Length is 41 seconds (All Minimum times are satisfied)

* CAPSSI (Release 11) - Based on Delay Methodology Per 1985 Highway Capacity Manual

C A P S S I
COMPREHENSIVE ANALYSIS PROGRAM
FOR A SINGLE SIGNALIZED INTERSECTION *

11-16-95

Santa Clara County
EX + AP + PR + EXPECTED GROWTH
SOLUTION USING REQUIRED CYCLE TIME

5. Monterey/Highland — P.M Peak Hour — FLN:5eg_p Scenario 1

Movement	EBT	EBL	EBR	SBT	SBL	SBR	WBT	WBL	WBR	NBT	NBL	NBR
Phase 1 - 9 secs	.	X	X	.	.	.	.	.	.	.	.	.
Phase 2 - 7 secs	.	.	.	.	.	.	.	.	.	X	X	.
Phase 3 - 26 secs	.	.	.	X	.	X	.	.	.	X	.	.
Phase 4 - 0 secs	.	.	.	.	.	.	.	.	.	.	.	.
Phase 5 - 0 secs	.	.	.	.	.	.	.	.	.	.	.	.
Phase 6 - 0 secs	.	.	.	.	.	.	.	.	.	.	.	.

	EBT	EBL	EBR	SBT	SBL	SBR	WBT	WBL	WBR	NBT	NBL	NBR
Critical Mvmt-**		****		****							****	
Peak 15 Vol -vph		83	58	532		85				476	62	
Saturation -vph		1700	1800	3600		1800				3600	1700	
Lost time -sec		5.00	2.00	6.00		2.00				6.00	4.00	
Relative Sat 'X'		0.51	0.19	0.31		0.08				0.21	0.51	
Effective Gr-sec		4	7	20		24				27	3	
Move Time -sec		9	9	26		26				33	7	
Min/Ped Time-sec		5	10	26		26				15	4	
Prog Factor PAF		1.00	1.00	1.00		1.00				1.00	1.00	
AvDelay/veh -sec		16	11	5		3				2	17	
Level of Service		C+	B-	B+		A				A	C+	
Av.'Q'/ lane veh		1	1	2		0				1	1	
Veh Stopping %		95	86	61		45				41	96	
Do Veh Clear ?		YES	YES	YES		YES				YES	YES	

Whole Intersection - Weighted Av Delay (sec) = 6 Level of Service = B+
Critical Movements - Weighted Av Delay (sec) = 8 Level of Service = B+
'' '' - Intersection Capacity Utilization (ICU) = 0.36

Required Cycle Length is 42 seconds (All Minimum times are satisfied)

* CAPSSI (Release 11) - Based on Delay Methodology Per 1985 Highway Capacity Manual

APPENDIX I

Noise Report

Prepared by

Illingworth & Rodkin, Inc.

November 1995

HAYES VALLEY RANCH EIR
ENVIRONMENTAL NOISE ASSESSMENT

December 4, 1995

◆ ◆ ◆

Prepared for:

Bert Verrips
Nolte & Associates
60 South Market, Suite 300
San Jose, CA 95113

Prepared by:

Richard R. Illingworth, PE

ILLINGWORTH & RODKIN, INC.
Acoustical Engineers
85 Bolinas Road, Suite 11
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(415) 459-5507

Job No. 95-012

INTRODUCTION

This report assesses the noise impact that development of the Hayes Valley Ranch project would have on adjacent properties and the compatibility of the project with onsite noise. The report describes local guidelines pertaining to noise impact, criteria for determining the threshold of environmental noise impact, a description of noise sensitive receptors in the area and a discussion of the existing noise environment, a discussion of the noise sources associated with the proposed project, and their impact on the adjacent environment.

Regulatory Background

Santa Clara County

The Noise Element of the County of Santa Clara's General Plan establishes an L_{dn} of 55 dBA as the goal for outdoor activity areas in new residential development. An L_{dn} of 45 dBA is the indoor goal for new residential development.

The County's Noise Element does not contain quantitative criteria for establishing the amount of noise increase that would be considered a significant noise impact.

The Santa Clara County's Noise Ordinance limits the amount of noise that activities can generate. For residential uses the noise generated by the offending noise source is not to exceed a noise level of 55 dBA for a cumulative period of more than 30 minutes in any hour. The noise can exceed 60 dBA for a cumulative period of not more than 15 minutes in any hour, 65 dBA for a cumulative period of not more than 5 minutes in any hour, nor a noise level of 75 dBA for any time period. Between 10 pm and 7 am the allowable levels are reduced by 10 dBA.

Noise Impact Assessment Criteria

Appendix G of the CEQA guidelines "Significant Effects" states that a project will normally have a significant effect on the environment if it will:

(a) conflict with adopted environmental plans and goals of the community where it is located, and
(b) increase substantially the ambient noise levels for adjoining areas.

The only community goals applicable to the noise effects of this project would be that if the outdoor noise level in the new residential portion of the project would exceed 55 dBA, mitigation measures would have to be considered. Since neither the local standards nor the state guidelines define what a substantial increase would be, the following criteria will be used. These criteria are based on the potential for an increase in noise to create adverse community response. If the average hourly sound level generated by the project does not exceed the existing background noise level (L_{90}) by 5 dBA or more, the impact will be considered insignificant. If the noise generated by the project would result in an increase of greater than 5 dBA and cause the L_{dn} to exceed 55 dBA at an existing residence, the impact will be considered significant.

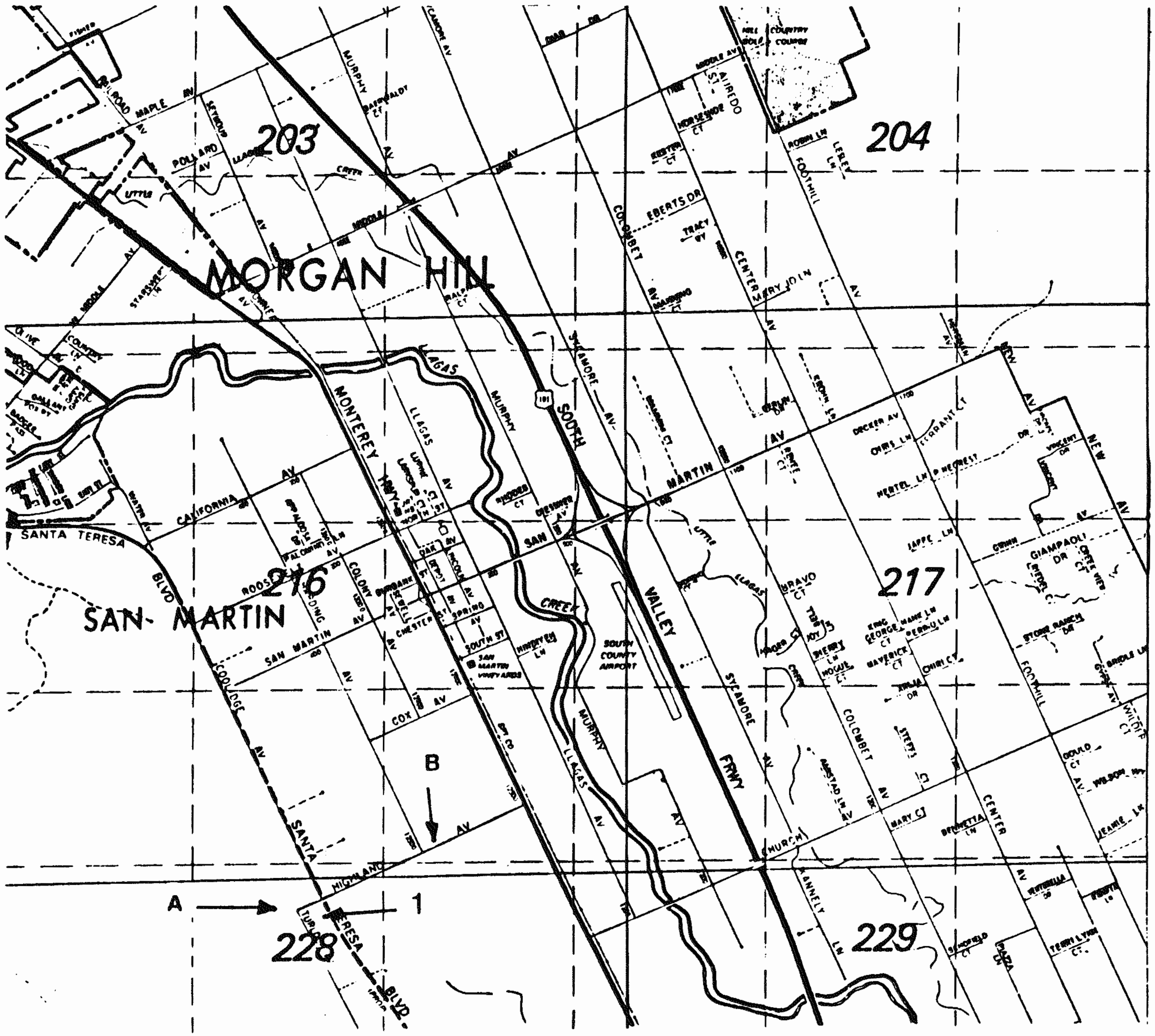
Construction Noise Criteria

Since construction activities are generally of relatively short duration, impacts are assessed against the potential for indoor/outdoor speech interference. Outdoors, if noise levels do not exceed 60 dBA, speech interference will be minimal. Correspondingly, if the 60 dBA criteria is not exceeded outdoors, indoor speech disturbance will not occur either. Therefore, 60 dBA outdoors is used as the criteria against which to assess potential for construction noise impacts.

Existing Conditions

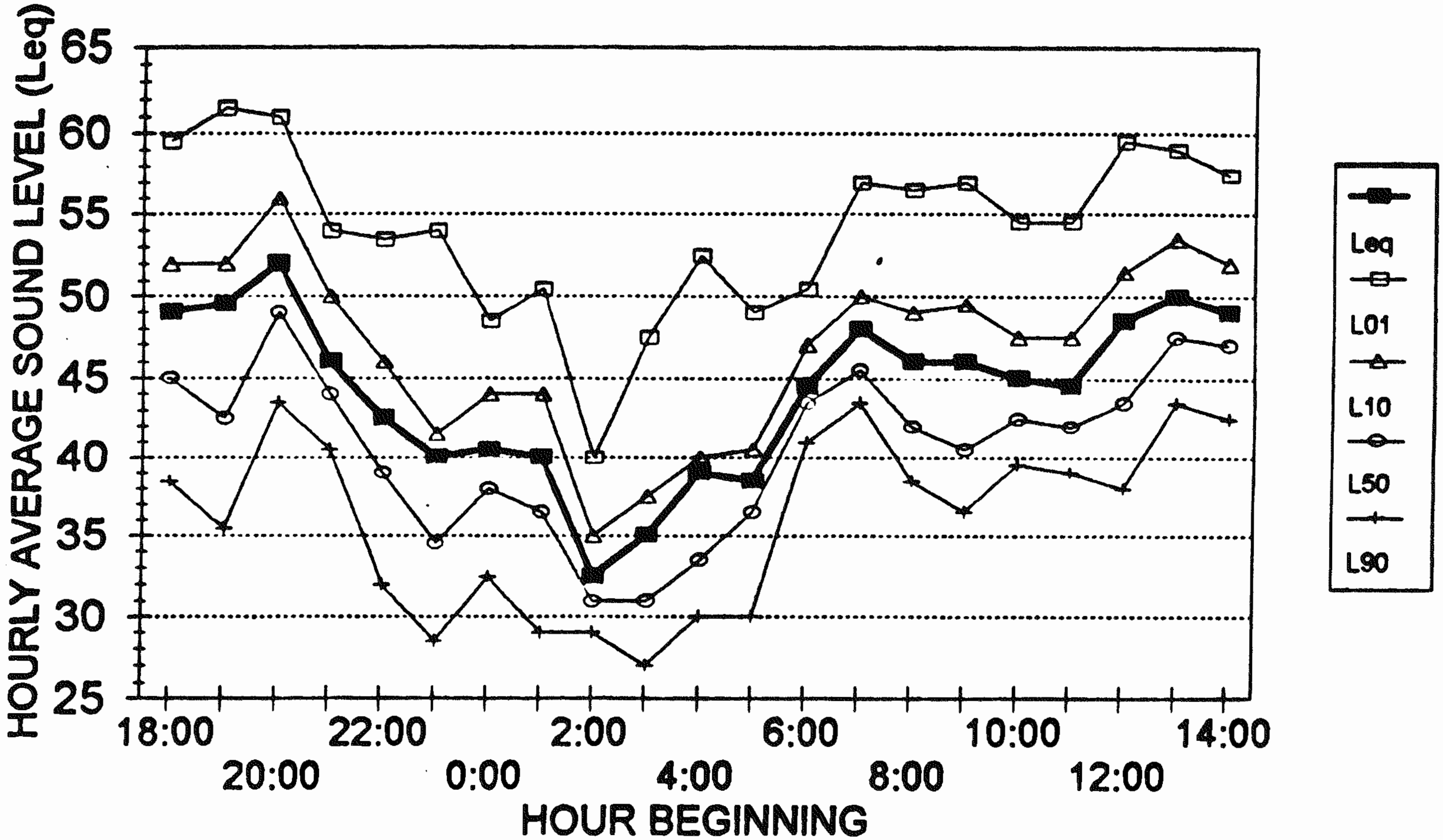
Noise measurements were made at three locations in the vicinity of the project to quantify the ambient noise environment. The noise measurements were made at the three locations shown on Figure 1. Sites A and B were monitored for a 24-hour period in 1990 by Illingworth and Rodkin, Inc. Site 1 was monitored for 15 minutes on April 18, 1995. Observations made in 1995 indicated that the measurements at Sites A and B in 1990 remain representative of the ambient noise environment at these locations. Site A is at the existing ranch at the eastern edge of the site and represents the noise environment for receptors not adjacent to a road. Site B is on Highland Avenue at a distance of 41 feet from the center of Highland Avenue just east of Harding Avenue. Results of the measurements at Sites A and B are shown in Figures 2 and 3. The L_{dn} at Site A was 49 dBA and the L_{dn} at Site B was 58 dBA. The highest noise levels at these locations were generated by distant jet aircraft and traffic. The background noise level at Site A was significantly lower than at Site B because it is removed from distant traffic. The background noise level at Site A ranged from 27 to 32 dBA during the nighttime hours and 35 to 43 dBA during the daytime hours. The noise measurement at Site 1 was conducted at a distance of 50 feet from Santa Teresa Boulevard just south of Highland Avenue. During the

(3)



Noise Measurement Locations	Figure 1

ILLINGWORTH & RODKIN, INC./Acoustical Engineers

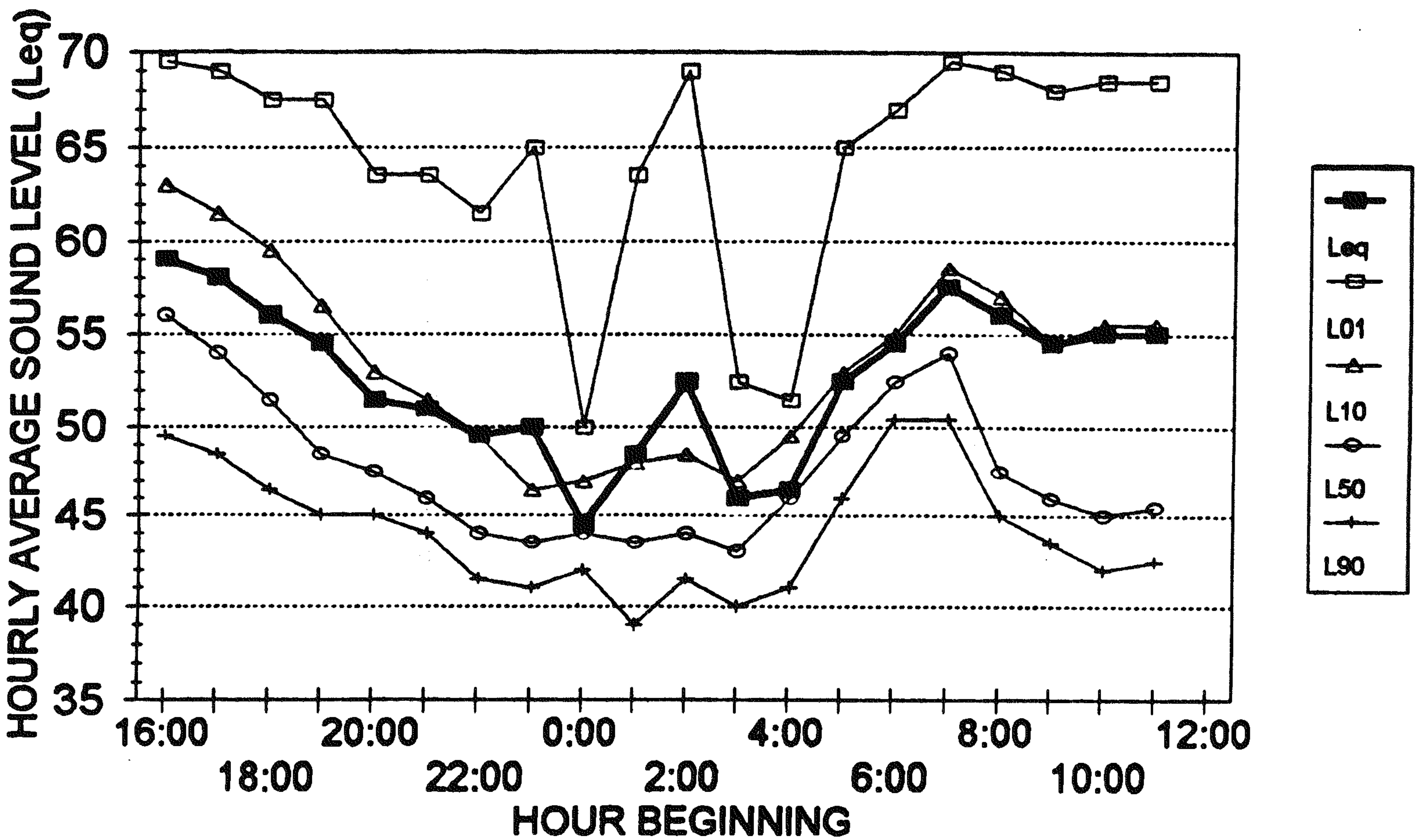


Location A
Existing Ranch - West of Highland Avenue
April 10-11, 1990

Figure 2

ILLINGWORTH & RODKIN, INC./Acoustical Engineers

(5)



Location B
Highland Avenue Just East of Harding Avenue
April 11-12, 1990

Figure 3

measurement an equivalent hourly flow rate of 216 vehicles per hour passed this site. The average noise level was 62.9 dBA. The traffic report indicates that currently the PM peak hour traffic volume along this stretch of the road is about 402 vehicles per hour. Based on this volume the L_{dn} at this location is currently 66 dBA at 50 feet from the centerline.

Impact Assessment

The proposed project would consist of 41 single-family homes and an 18-hole golf course with club house. The major noise sources associated with the project would be golf course maintenance activities, traffic on the new access road, and added traffic to the roads serving the site.

> Impact 1: Noise would be generated by equipment used to maintain the 18-hole golf course. This would potentially cause a significant impact at the existing ranch.

The closest existing residence to the proposed golf course would be the existing ranch near the eastern limits of the project site. The second closest residence would be one home to the north of the site on the ridge, looking down on the study area. The existing ranch house would be 900 feet from the golf course. The home overlooking the site would be at the closest point about 1200 feet from the golf course. The mowing machines used at the golf course would be the loudest noise sources. These pieces of equipment typically generate noise levels no higher than 70 dBA at a distance of 50 feet. Even when operating at the northerly property line, the maximum noise levels generated by lawn mowers would be only 41 dBA outside of the nearest home to the north. Generally, maximum noise levels would be lower. Average noise levels generated by the mowers would be less than 5 dBA above the background noise level in the area. A noise level of 41 dBA will not interfere with outdoor activity nor be more than barely audible inside a home even with the windows open. This would not be considered a significant impact. The noise of lawn mowers would not violate Santa Clara County's Noise Ordinance limits operated either during the day or at night. Mowers operating on the golf course 900 feet from the ranch house would generate maximum noise levels of about 45 dBA. Average noise levels would be less. Operation of this equipment would not violate the limits of the ordinance during the day or at night. During nighttime hours the Noise Ordinance limit could be reached, but not exceeded, at the ranch house. This is not a significant noise impact.

Impact 2: Traffic generated by the project would increase noise levels at existing residences.

Access to the site would be via Highland Avenue to a new access road. Using the traffic volumes projected for this EIR we calculate that when the project traffic is added to the existing traffic, the traffic to be added by approved projects, and the expected growth in the area noise increases on all roads in the area, except along Highland Avenue, would be less than 1 dBA. There is one existing home on Highland Avenue west of Coolidge Avenue (Santa Teresa Boulevard). This house would be removed as part of this project. Noise levels would increase by 8 dBA along this stretch of the road but there would be no existing noise sensitive receptors impacted. Between Coolidge Avenue (Santa Teresa Boulevard) and Harding Avenue noise levels are calculated to increase by 5 dBA as a result of this project. The 5 dBA increase would result in the 55 L_{dn} standard being exceeded within 50 feet of the centerline of Highland Avenue. This would increase noise levels in the front yards of homes along this street to a level of 55 - 60 L_{dn}. Noise levels in the backyards, where people would be expected to expend the most amount of time, would be significantly below an L_{dn} of 55 dBA. Noise levels along Highland Avenue between Harding Avenue and Monterey Road would increase by less than 2 dBA. Noise levels already exceed an L_{dn} of 55 dBA at a distance of 50 feet from the centerline in this area. The increase due to the project and all other growth of approved projects in the area would not be significant.

The traffic on the new access road itself will generate additional noise. The existing ranch house on the east side of the site would be potentially affected by traffic noise from the access road. Given the distance between the ranch and the road and the projected traffic volumes, we calculate that the average noise level due to the traffic on the access road would be below 40 dBA outside of the existing ranch. An average noise level of 40 dBA at the ranch would represent an increase in the background noise level. However, the resulting noise level would remain below the criterion level for an L_{dn} not in excess of 55 dBA in residential development. Similarly, noise levels outside of the new lots along the access road would be less than an L_{dn} of 55 dBA at 50 feet. Traffic noise impacts are not significant.

Impact 3: During construction, noise levels will be temporarily elevated in the area. This is not a significant impact.

Most of the existing noise receptors in the area are far from the potential construction activities. The major exception is the existing ranch at the east end of the site. During construction, maximum noise levels generated by grading, paving, and other activities will be below 60 dBA at all receptors except the existing ranch. Average noise levels will be 5 to 10 decibels lower. If average levels do not exceed 60 dBA, there will be no interference with outdoor activity or indoor activity, although the construction may be occasionally audible. Noise levels at the existing ranch could reach as high as 90 dBA with average levels of up to 85 dBA. During most of the construction, however, noise levels would be significantly below the 60 dBA criteria.

> Impact 4: Portions of three of the proposed lots adjacent to Coolidge Avenue (Santa Teresa Boulevard) would be exposed to an L_{dn} in excess of 55 dBA. Noise levels on portions of these lots would be inconsistent with the goal for outdoor noise levels not in excess of an L_{dn} of 55 dBA per the County's General Plan.

The future traffic volume, including existing traffic, traffic generated by all approved projects, the project-generated traffic, and expected growth in the area will generate an L_{dn} of 55 dBA at a distance of 315 feet from the centerline of Coolidge Avenue (Santa Teresa Boulevard). The two lots (lots 4 and 6) closest to Coolidge Avenue (Santa Teresa Boulevard) would be set back about 290 feet from the centerline. Noise levels within 315 feet of the centerline would exceed the 55 L_{dn} goal set forth in the Noise Element of Santa Clara County's General Plan for outdoor noise exposure in new residential developments. The L_{dn} would reach 67 dBA at a distance of 50 feet from the center of the Boulevard. Assuming that the primary outdoor use areas for these two lots are 315 feet, or more, from the centerline of Coolidge Avenue (Santa Teresa Boulevard) the guidelines would be met and there would be no significant impact.

MITIGATION

- To minimize the potential for construction noise impacts, construction should be restricted to the hours of 8:00 AM to 5:00 PM and all equipment used on the project should be adequately muffled and maintained.

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality

RECEIVED
FEB 07 1996
NOLTE and ASSOCIATES
SAN JOSE

February 5, 1996

Bert Verrips
Nolte and Associates
60 South Market Suite 300
San Jose CA 95113

SUBJECT: Hayes Valley Ranch EIR -- Response to Comments

Dear Bert:

The following is my response to the Department of Health's comment regarding the impact of noise generated from activities at the clubhouse on the nearest existing residences. There are two existing residences. One is located to the east on a ridge overlooking the valley. This house is located about 3,600 feet from the clubhouse. The second is an existing ranch to the south located about 2,400 feet from the clubhouse. The conditions of maximum sound propagation would be a temperature inversion with a light wind blowing towards the receiver. Under these conditions the sound levels will bend down from the atmosphere toward the receptor negating shielding by intervening hills, buildings and other barriers. We calculate that under these conditions the sound level of a loud rock band inside the clubhouse with the windows open would be about 35 to 40 dBA outside the closest home, and about 35 dBA outside the further home. Under the vast majority of meteorological conditions the sound levels would be 10 to 20 dBA lower, and essentially inaudible. Under conditions of good sound propagation the sound of the a very loud event at the clubhouse could be audible outdoors. However, it is also most likely under these conditions the windows in the clubhouse would be closed because it would have to be quite cold to create the type of inversion needed to result in the highest sound level. We would expect it to be a rare event when the sound of the activity was noticeable at the existing residences.

This ends my response.

Sincerely yours,

Richard R. Illingworth, PE

RRI:lk
(95-012)

85 Bolinas Road, #11 • Fairfax, California 94930 • (415) 459-5507 • FAX (415) 459-6448

APPENDIX J

Air Quality Report

Prepared by

MO'C Physics Applied

November 1995

Air Quality Study

Hayes Valley Development Plan

Santa Clara County

November 1995
[revised]

mo'c Physics Applied
1032 Elwell Court, room 244
Palo Alto, California 94303
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prepared for

Nolte and Associates
[Bert Verrips, AICP, Project Manager]

by

Mike O'Connor, Ph. D.

Contents

THE CRITERIA POLLUTANTS

This report presents quantitative information on certain air pollutants, namely ozone, carbon monoxide, airborne particulate matter, and, because of their roles as precursors to ozone, gaseous hydrocarbons and oxides of nitrogen. These pollutants are referred to as "criteria" pollutants because they are among the select air contaminants for which there exist State and Federal criteria for acceptable ambient air quality.

Gaseous pollutants such as the ozone precursors and carbon monoxide are principally evolved from processes which make use of fossil fuels and other petrochemical products— in engines, in industrial processes, and in the generation of electrical power.[1] Small particles are also among the products of combustion processes and they are released into the atmosphere along with flue and tailpipe gases. However, they are principally generated by other processes which are described below.

Concentrations of the criteria pollutants and some others are monitored by the Bay Area Aii Quality Management District (BAAQMD) which maintains multi-pollutant stations at 120 N. Fourth Street in San Jose and at Ninth and Prince Valle Streets in Gilroy.[2] There are no stations either in Morgan Hill or in the vicinity of the Hayes Valley Plan area. The highest ozone and carbon monoxide pollution concentrations which have been recorded in San Jose and Gilroy in each of the last 5 years are listed below along with the annual numbers of days on which concentrations exceeded the most stringent standards for each of the pollutants.

---

1 Methane gas is a notable exception. A mildly reactive hydrocarbon which plays a small role in the development of photochemical smog, it emanates in large quantities from the decomposing vegetation and municipal waste.

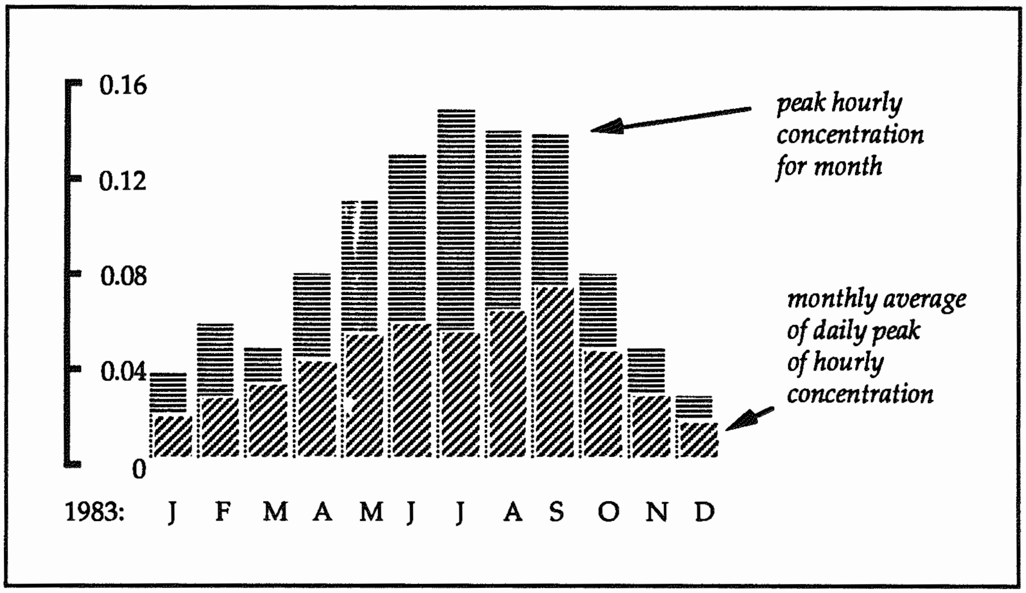
2 There are other stations in San Jose, such as the Moorpark station. Only seasonal monitoring of ozone and carbon monoxide is conducted at the station in Gilroy.

Until recently, concentrations of ozone and carbon monoxide have exceeded Federal standards in at least some parts of the San Francisco Bay area several times each year. However, the basin was recently declared to be in attainment of all the air quality standards which are ordained by the Federal Clean Air Act.[3]

OZONE

Summer is the "smog" season, the season for ozone. The upward escape of pollutants from sources near the ground is then often hampered by a blanketing layer of warm air aloft, an "inversion" layer. When during the summer the inversion layer is present, prevailing winds in the south Bay area are then typically light (e. g., 5 to 10 mph) but steady, from the northwest.

Ozone Concentrations (ppm)
Downtown San Jose



[3] Unhappily, an ozone violation occurred within 48 hours of the US Environmental Protection Agency's declaration of ozone attainment for the Bay area. There followed 10 others, all in the last ozone season! Summarized data for the most recent ozone season are not yet available, hence table 1 stops at 1994 (as does table 2). Under the Clean Air Act, three or fewer violations of the ozone criterion are allowed in any period of three consecutive years. However, the attainment designation yet remains in force.

Ozone is a colorless gas which is produced from "precursor" compounds of hydrocarbons and oxides of nitrogen which react in warm air under sunlight over a period of hours. Ozone is not particularly evident near pollution sources such as roadways because there is a delay of some hours between emissions of the precursors and peak ozone production. That is, the substantial interlude between the earliest am-commute emissions of the precursors and the subsequent attainment of the daily peak concentration of ozone is ample time for air currents to carry the precursors tens of miles downwind. Consequently, ozone is found not to be particularly concentrated in highly-urbanized areas but to be spread out throughout the County. For example, note that the recorded peak concentrations and the frequencies with which the State standard was exceeded in Gilroy easily rival those in more-populous San Jose [table 1].

Thus it is to be expected that the exposure of the Hayes Valley Plan area to ozone is approximately the same as that of metropolitan San Jose or Gilroy.

Likewise, it is even the case that ozone concentrations are not entirely the outgrowths of the local emissions of any County, for there is a sizeable component which is imported. Some of the ozone precursors from the vehicular and industrial sources within San Mateo and Alameda counties are transported into Santa Clara County, along with some ozone which has already been produced from them. Likewise, ozone and ozone precursors which are generated in Santa Clara County drift into the downwind counties, especially San Benito.[4]

Days on which ozone levels exceed the Federal standard are now rare in the Bay area. Over a period of two decades there has been a downtrend in concentrations, which is however not clearly manifest in the most recent 7 years of data of table 1 (the table does seem to exhibit a downtrend in the number of violations).

---

[4] Under certain conditions pollutants are transported from Santa Clara County to Santa Cruz and Monterey counties, and, under other conditions, into Merced County.

TABLE 1
OZONE DATA
DOWNTOWN SAN JOSE AND GILROY

year	*peak 1-hour concentration (ppm)**		*annual days exceeding***	
	San Jose	*Gilroy*	*San Jose*	*Gilroy*
1988	0.12	0.14	12	23
1989	0.13	0.13	10	10
1990	0.12	0.12	4	5
1991	0.10	0.13	6	5
1992	0.12	0.12	3	12
1993	0.11	0.11	4	10
1994	0.11	0.10	2	3

* "ppm" means parts per million.
** These are the numbers of days on which concentrations exceeded the State's 1-hour standard. The standards are listed below in the subsection entitled "AMBIENT AIR QUALITY STANDARDS".

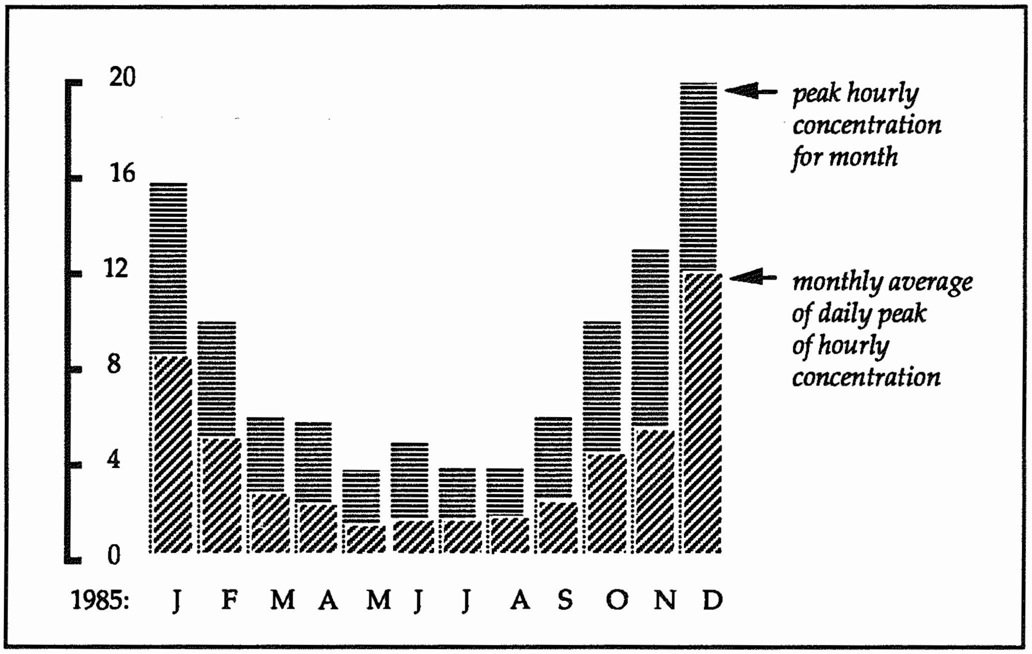
Source: BAAQMD and California Air Resources Board Data

CARBON MONOXIDE

Winter is the season for carbon monoxide (CO) contamination, for inversion layers are also present on cold, still winter nights. On such nights downslope "drainage" flows reverse the daytime pattern of up-slope, up-valley flow, and for several interim hours in the late evening the atmosphere is almost completely still. Under these conditions high concentrations of air contaminants such as carbon monoxide can develop from local pollution emissions, for lack of ventilation. The peak 8-hour concentrations are usually from about 4:00 pm to midnight.

Carbon monoxide is a clear, odorless gas. The principal emissions of this pollutant occur as a component of vehicular tailpipe effluence. Consequently, at any time of the day or in any season of the year, the greatest concentrations are usually found near roadways. (Recall that ozone is not found to be concentrated near roadways because it is not directly emitted by vehicles.)

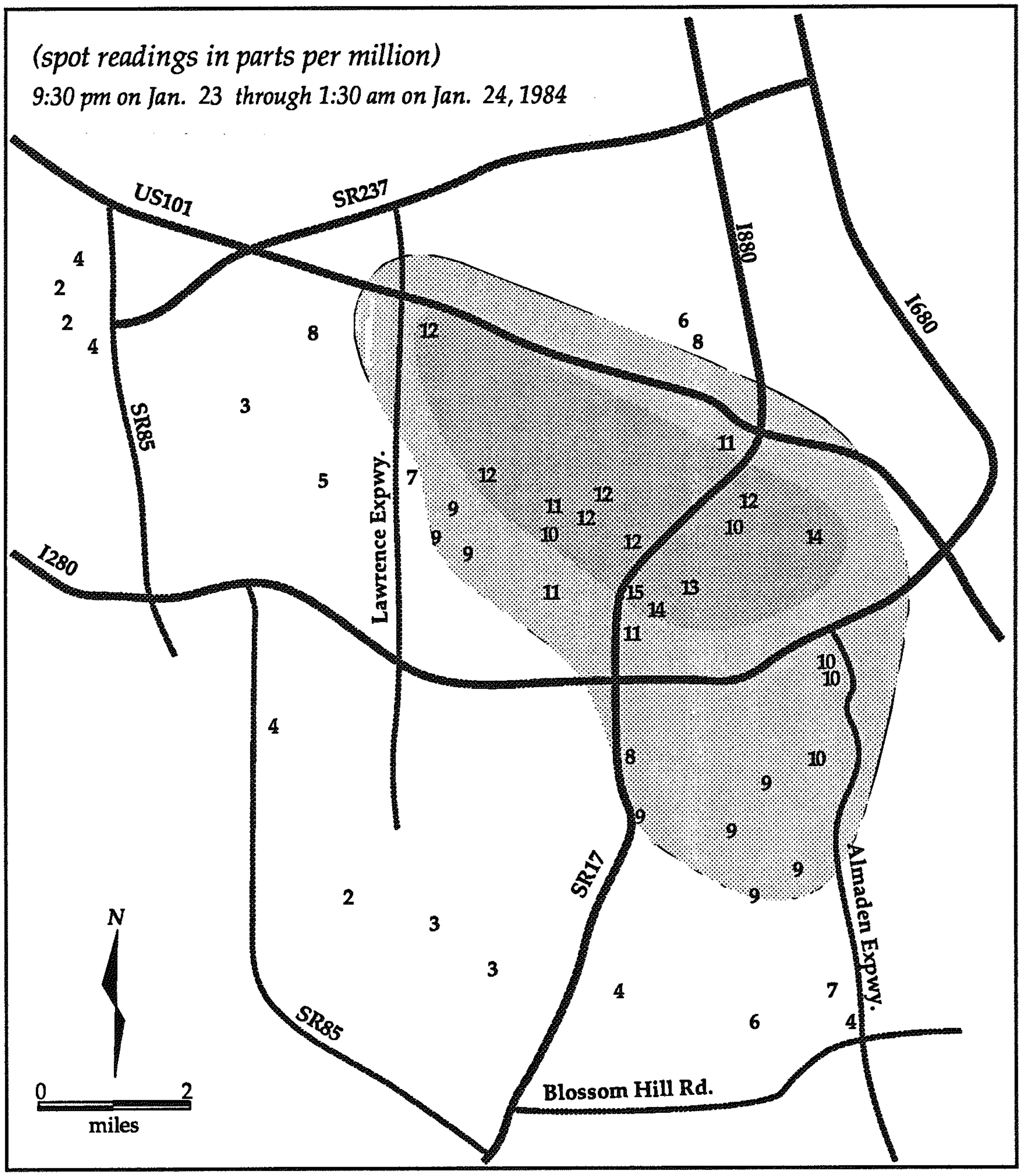
Carbon Monoxide Concentrations (ppm)
Downtown San Jose



Studies of carbon monoxide pollution by the BAAQMD and Caltrans have demonstrated that during evenings on which CO concentrations are particularly elevated there is a more or less uniform "cloud" of the gas which persists after commute traffic has waned. Even during such episodes the greatest concentrations are found along roadways, but, there is then also a large "background" component which builds up under the inversion layer as the air passes over busy roadways— the cloud. The background exceeds the component that arises from any one roadway. However, these cloud-like concentrations do not extend much beyond the urbanized areas, as is demonstrated by the CO map of San Jose below.[5]

[5] See: BAAQMD, "Air Currents", Volume 27, No. 8, August, 1984; and No. 11, November, 1984; Thomas E. Perardi, Robin E. DeMandel, Dick C. Duker, & Wayman Siu, BAAQMD, "Carbon Monoxide: Hotspots, Coldspots and Implications for Attainment Planning"; D. C. Duker, D. A. Levaggi, T. Umeda, R. E. DeMandel, & T. E. Perardi, "Measurements of a Carbon Monoxide Cloud in San Jose, California". The latter two papers were prepared for the 77th Annual Meeting and Exhibition, Air Pollution Control Association, San Francisco, CA , June 24-29, 1984.

San Jose Carbon Monoxide Concentrations



This localization about areas of high traffic density is in keeping with the very low 1- to 2-mph wind speeds which exist whenever CO concentrations are high, as such wind speeds imply that there is a limit to how far the gas can be transported before atmospheric conditions cycle through diurnal changes which cause concentrations to disperse.

TABLE 2
CARBON MONOXIDE DATA
DOWNTOWN SAN JOSE AND GILROY

year	*peak 8-hour concentration (ppm)**		*annual days exceeding ** *	
	San Jose	*Gilroy*	*San Jose*	*Gilroy*
1988	10.3	3.3	3	0
1989	12.0	3.1	6	0
1990	11.3	3.3	5	0
1991	11.0	3.8	4	0
1992	7.8	3.4	0	0
1993	6.9	3.0	0	0
1994	8.1	2.6	0	0

* "ppm" means parts per million.
** These are the numbers of days on which concentrations exceeded the Federal 8-hour standard. The standards are listed below in the subsection entitled "AMBIENT AIR QUALITY STANDARDS".

Source: BAAQMD and California Air Resources Board Data

Note that the data above [table 2] imply that Gilroy lacks the traffic density to produce concentrations exceeding the CO standards. It is thus clear that CO standards are not exceeded in the more sparsely-populated vicinity of the Hayes Valley Plan area, and that background concentrations there are low.

A downtrend is somewhat discernible from the above data, but twenty years ago concentrations were very obviously higher. The lack of exceedences in the most recent years caused the BAAQMD to apply for "attainment" status with regard to carbon monoxide. It has been granted by the US Environmental Protection Agency.

PARTICULATE MATTER

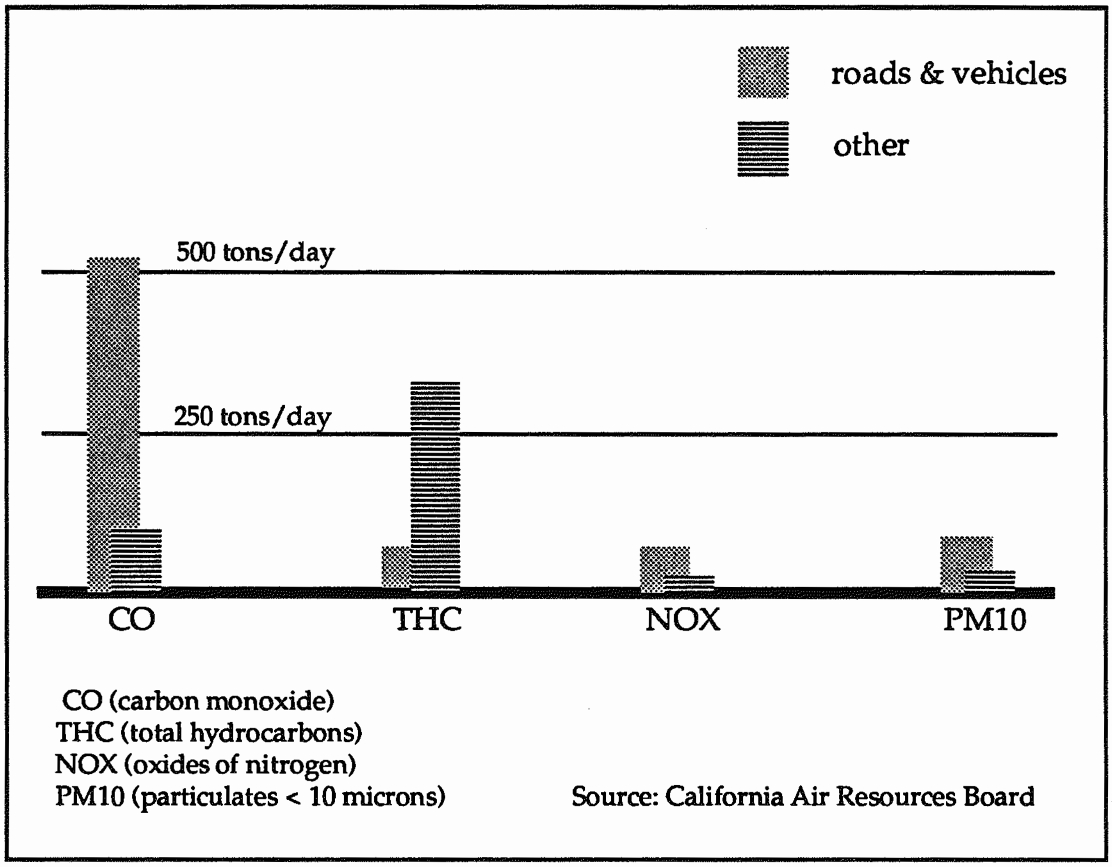
There are natural processes which cause particulate matter to become airborne, such as wind erosion and fires. However, airborne concentrations of fine particles develop in urban areas because conditions exist which cause dirt to be transported onto roadways where it is pulverized and "re-suspended", and, because construction and demolition activities either directly release particles or cause dirt to be deposited on roadways where the same action of pulverization and re-suspension occurs. Tire wear is another source of airborne particulate matter in urban areas. In agricultural areas the tilling of fields is a seasonal source of airborne particulate matter, as is the burning of agricultural wastes.

The particulate monitoring stations closest to the Hayes Valley Plan area are in San Jose. The data collected in San Jose show tens of days on which concentrations exceeded the State's criterion for airborne particulate matter each year, but these data are clearly not representative of particulate concentrations in the vicinity of the Plan area because of the relative scarcity of sources of particles in Hayes Valley. However, it is likely that the State's particulate standard is exceeded a few times each year in and about the Plan area: in any given year only a few monitoring stations in particularly undeveloped and "wet" areas of the State report no days on which concentrations exceeded the State's standard for airborne particulate matter.

SOURCE INVENTORY

The BAAQMD and the California Air Resources Board keep track of pollution sources on a county-by-county basis. Vehicles on roads are the predominate sources of carbon monoxide, oxides of nitrogen and airborne particles. (The principal mechanism by which vehicles contribute to airborne particle concentrations is dirt on roads being re-suspended by passing vehicles— not tailpipe emissions or tire wear.)

Santa Clara County Emissions (1987)



Source: California Air Resources Board

Among all of the gaseous hydrocarbons are some which are prone to react with oxides of nitrogen to produce ozone. They normally comprise about 90% or so of all of the vehicular emissions of hydrocarbons. All of the emissions of hydrocarbons taken together— whether they are very reactive or not— are referred to as "total hydrocarbons" (THC). Methane gas, a hydrocarbon of low reactivity, is predominate among the non-vehicular emissions of hydrocarbons. The organic solvents which are used in glues, in paints and other coatings and for various industrial purposes are also a significant component of the hydrocarbon emissions. They often consist of reactive hydrocarbons.

Similarly, the sum total of all of the tonnage of all the particles which are lifted into the atmosphere is referred to as "total suspended particulates" (TSP) whereas the component which consists of particles sized at less than ten microns is denoted by PM10.

THE REGIONAL PLAN

The Bay Area Air Quality Management District primarily has jurisdiction over stationary sources of air pollution; it has no land use control jurisdiction except where exercise of its jurisdiction over stationary sources has the side effect of controlling land use.

The District would not have a role in regulating the "indirect" emissions that would be associated with the Hayes Valley Plan (e. g., carbon monoxide from vehicular traffic going to and from the project).

CRITERIA FOR SIGNIFICANCE

As this is an "impact" report, it is an assessment of the significance of foreseeable *changes* in various indicators of air quality which would be brought about by development under the Hayes Valley Plan. The California Environmental Quality Act (CEQA) prescribes the contents of environmental assessments, albeit in very general terms, and requires that the assessments include declarations of "significant" adverse impacts and prescriptions of feasible measures to mitigate the impacts. For air quality, the term "significant" has been interpreted to mean that a plan or project must be declared to have a significant adverse effect if it would "violate any ambient air quality standard, contribute substantially to an existing or projected air quality violation, or expose sensitive receptors to substantial pollutant concentrations".[6]

The Bay Area Air Quality Management District has published guidelines for the assessment of urban projects. The guidelines are intended to be applied to developments such as the Hayes Valley Plan, but, given that the District has no jurisdiction over such developments, the guidelines are purely advisory in character.[7]

The guidelines suggest that a project should be declared to have a significant impact if: (1) local carbon monoxide concentrations are increased so as to cause the Federal standard of 9.0 ppm over 8-hours to be exceeded; (2) project-generated emissions of carbon monoxide by a *stationary* source exceed 550 pounds per day; or, (3) emissions of hydrocarbons, nitrogen oxides or airborne particulate matter from all project-related sources exceed 150 pounds per day. Mitigation is recommended if the impact is found to be significant.

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[6] Office of Planning and Research of the State of California, "CEQA: The California Environmental Quality Act, Law and Guidelines", January 1984

[7] BAAQMD, "Air Quality and Urban Development; Guidelines for Assessing Impacts of Projects and Plans", November 1985

AMBIENT AIR QUALITY STANDARDS

All of the State and Federal ambient air quality standards are listed in table 3 below. The entries that are in boldface type identify the criteria that were used to determine the numbers of days on which concentrations exceeded standards. (See, for example, the last columns of table 1 and 2 and the discussion on page 8 above.)

There are several State and Federal standards which pertain to pollutants other than the three for which historical data have been provided. Data pertaining to the other pollutants are not listed here, because the County is already in attainment of the standards which apply to them. For example, the hourly concentration of sulphur dioxide at the N. Fourth Street monitoring station in San Jose is never as high as 0.10 ppm; the State standard is 0.25 ppm.

Of course the standards are intended to limit the adverse health affects of the pollutants. The ozone standards also serve to control damage to crops, natural vegetation and materials. Attainment of the particulate standards would also place limits on the degradation of visibility— for aviation safety and aesthetic satisfaction.

TABLE 3
AMBIENT AIR QUALITY STANDARDS [8]

Pollutant	*Averaging Time*	*California*	*Federal*
ozone	1 hour	0.09 ppm	0.12 ppm
carbon monoxide	8 hours	9 ppm	9 ppm
	1 hour	20 ppm	35 ppm
nitrogen dioxide	annual avg.	—	0.053 ppm
	1 hour	0.25 ppm	—
sulphur dioxide*	annual avg.	—	0.03 ppm
	24 hours	0.04 ppm	0.14 ppm
	1 hour	0.25 ppm	—
suspended particles	ann. geom. mean	30 $\mu g/m^3$	—
(< 10 microns)	24 hours	50 $\mu g/m^3$	150 $\mu g/m^3$
	annual avg.	—	50 $\mu g/m^3$
all particles	8 hours	visibility <10 mi**	—
sulfates	24 hours	25 $\mu g/m^3$	—
lead	30 days	1.5 $\mu g/m^3$	—
	1/4 year	—	1.5 $\mu g/m^3$
hydrogen sulfide	1 hour	0.03 ppm	—
vinyl chloride	24 hours	0.01 ppm	

[8] See "California Air Quality", Volume XXIV, Annual Summary, California Air Resources Board. A "ppm" is a part per million; a $\mu g/m^3$ is a microgram per cubic meter.

* There is also a Federal "secondary" standard for sulphur dioxide, which is a goal which is to be pursued after the primary standard is attained. The criterion level is 0.5 ppm (3-hour).

** This visibility standard is now stated in terms of an "extinction coefficient" of 0.23 per kilometer, when the relative humidity is less than 70%.

LOCAL TERRAIN

Hayes Valley has two openings onto the "floor" of Santa Clara Valley. From its intersection with Monterey Highway, the former US 101 (which is also known as El Camino Real), Watsonville Road wends in a generally southwesterly direction through the first opening (or pass) into Hayes Valley and approximately a mile further before the Llagas Creek crossing is reached. Near the Creek crossing is an intersection with a lesser roadway that continues through the floor of Hayes Valley in a generally southeasterly direction for approximately 2 miles before the floor of the Santa Clara Valley is again reached through the second opening. The roadway through the Hayes Valley becomes Highland Avenue, which intersects Monterey Highway approximately 3 1/2 miles southeastward of Monterey Highway's intersection with Watsonville Road.

The Hayes Valley Plan area covers most of the floor of Hayes Valley southeastward of Watsonville Road and extends part way into the hills that form the southwestern wall of the Valley.

The floor of Hayes Valley has an average elevation above sea level of approximately 400 feet, which is less than 150 feet above the adjacent areas of the floor of the Santa Clara Valley; it is roughly a half of a mile wide. The surrounding hills which form the "walls" of Hayes Valley are 300 to 500 feet higher in elevation than its floor.

These terrain features are of limited significance for air quality. Due to the sheltering effect of the adjacent hills that form the "walls" of Hayes Valley there appears to be some potential for stagnant air flow or "calms" to sometimes develop in Hayes Valley even while adjacent areas of the Santa Clara Valley have some measurable air flow. However, such temporary stagnation of air flow would be of little consequence, given the proposed low density of development and the substantial width of the floor of the Hayes Valley. This conclusion will be elaborated upon below.

THE PROJECT

The project would consist of 41 detached homes, a 35-room lodge, a restaurant and an 18-hole golf course. The golf course would be open to the public, but there would be just a small clubhouse of a few thousand square feet.

The traffic consultant estimates that the development would generate 93 pm peak hour vehicle trips and 57 am peak hour trips.[9]

OTHER DEVELOPMENTS

The traffic consultant has also projected about 1,010 pm peak hour vehicle trips and 958 am peak hour trips due to already approved developments in the vicinity of Hayes Valley. Other regional growth which was incorporated under the term "expected growth" was also represented in the traffic assignments. These estimates form the basis for the estimates pertaining to air pollutants which appear below.

EFFECTS ON CARBON MONOXIDE CONCENTRATIONS

The most congested intersection in the vicinity of the Hayes Valley Plan area would be the intersection of Monterey Road and San Martin Avenue. Estimates were made of wayside concentrations of carbon monoxide in the vicinity of that intersection in the future year 2000. [10]

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[9] Trip generation and trip assignment data were provided by TJKM Transportation Consultants: "A Traffic Study of the Proposed Hayes Valley Development", November 17, 1995. A "round trip' such as leaving and returning is counted as two trips— one trip each way.

[10] The methods by which these estimates were made are described in Air Quality Technical Analysis Notes, June 1988, and in Caline 4: A Dispersion Model For Predicting Air Pollutant Concentrations Near Roadways, November 1984. Both are by Paul Benson, P. E., of the Office of Transportation Laboratory, California State Department of Transportation.

The estimates thus constitute a hypothetical worst-case analysis of local concentrations of carbon monoxide due to existing traffic and to traffic associated with the project, with approved projects in its vicinity, and with other growth in the region. [11]

TABLE 4
CARBON MONOXIDE CONCENTRATIONS— YR 2000
[MONTEREY/SAN MARTIN INTERSECTION]

quadrant	*peak 8-hour concentrations (ppm)*
Northeast	4.7
Southeast	4.7
Southwest	4.6
Northwest	5.1

Note: These estimates incorporate an assumed background concentration of 2 ppm. The receptors were assumed to be 25 feet from the center of each of the nearest travel lanes of the cross streets. (There may actually be no receptors which are located *that* close to the intersection; further from the intersection, concentrations would be lower.)

The estimates show that there is no likelihood at all that concentrations of carbon monoxide would exceed State or Federal standards with the project and with other foreseen developments in place.

[11] For the worst-case estimates, meteorological conditions were assumed which are representative of the conditions which prevail during the worst days of the year for carbon monoxide pollution— in keeping with the fact that the State and Federal ambient air quality standards allow, depending on the agency and on the pollutant, either one day in which the quantitative criterion of table 3 is exceeded or none. For example, it was assumed that the wind would be at a speed of 1 meter per second, aligned at the worst angles to the roadways, and, that the atmospheric stability would be of class F (very stable).

VEHICULAR EMISSIONS ASSOCIATED WITH THE PROJECT

Estimates of the emissions of carbon monoxide, oxides of nitrogen and hydrocarbons that would be generated by the vehicular traffic which would be associated with the Hayes Valley project appear in table 5 below.

TABLE 5
ASSOCIATED VEHICULAR EMISSIONS
[PROJECT AND APPROVED DEVELOPMENT— YR 2000]

pollutant	*emissions (lbs/day)*
Carbon Monoxide	
Hayes Valley Project	160
Approved Developments	1,700
Oxides of Nitrogen	
Hayes Valley Project	20
Approved Developments	190
Total Hydrocarbons	
Hayes Valley Project	10
Approved Developments	120

The vehicular emissions associated with the project do not approach or exceed the quantities which the BAAQMD deem to constitute a significant impact. (See the discussion of criteria for significance on page 11 of this report.)

OTHER EMISSIONS ASSOCIATED WITH THE PROJECT

The project would generate other emissions of air pollutants. The chief sources would be gasoline-powered equipment such as lawn mowers, residential use of solvents, and fireplaces or woodstoves.

Very roughly speaking, for they vary, brick fireplaces produce 175 pounds of carbon monoxide (CO), 5 pounds of oxides of nitrogen (NOX), 50 pounds of hydrocarbons (THC), and 50 pounds of airborne particles (TSP) per ton of wood.[12] It is unlikely that the 41 homes which could be constructed under the Hayes Valley Plan would collectively burn as much as a quarter of a ton of firewood in a day.

Lawn mowers for the golf course could produce roughly 10 pounds of CO, 0.3 pounds of oxides of NOX, 1 pound of THC, and 0.02 pounds of TSP per hour. It could take an average of perhaps 10 hours per day each day to mow all the lawns and golf course grounds in the entire project area. Solvents in paints and various types of household products produce roughly 0.03 pounds of THC per day per capita. We can assume approximately 3 persons per household, or, 123 persons for all 41 residences.[13] Some additional allowance should be made for THC production by the lodge and the restaurant— say, half again as much.

To sum up the data in the above paragraphs, we could multiply the rates of pollutant emissions due to wood burning in pounds per ton by 1/4 ton per day, the rates of emissions by lawn mowing equipment in pounds per hour by 10 hours per day, and the rates of household solvent emissions in pounds per day capita by 123 persons (and multiply this latter product by 1.5) and then separately sum the various contributions for each pollutant. In round numbers, we would then conclude that on worst days, with most fireplaces in use as well as with mowing, there would be emissions of as much as 150 pounds of CO, 5 pounds of NOX, 30 pounds of THC and 15 pounds of TSP.

12 California Air Resources Board, "Emissions from Residential Fireplaces", April 1980

13 US Environmental Protection Agency, "Compilation of Air Pollutant Emission Factors— Volume I: Stationary Point and Area Sources", AP-42, Fourth Edition, September 1985

These are very rough estimates, but when these other project-generated emissions are added to the vehicular emissions which are shown on table 5 it is seen that they are clearly not enough to cause the project's entire impact on emissions to be declared to be significant based on the poundage. (See the discussion of the BAAQMD's guidelines on page 11 regarding criteria for significance.)

The carbon monoxide emissions from on-road vehicles, gasoline powered equipment and fireplaces operating within the Hayes Valley would be insufficient to cause local concentrations to exceed the State or Federal criteria: while the surrounding hills may cause stagnant air flow conditions to occur more frequently than elsewhere, the area of the Valley floor is quite substantial, and the proposed residential lots are not "City lots", so that the emissions of carbon monoxide per acre would be far less than in it is more urban areas.

CUMULATIVE EFFECTS

It has been estimated that reductions in per-vehicle-mile emissions of carbon monoxide and other pollutants due to improvements in motor vehicles that are of the magnitudes that are being projected by the California Air Resources Board would more than offset the effects of the expected growth in traffic volumes in the area. For example, the County has published an environmental impact report on its updated T2010 transportation plan. The revision contains projections of vehicular emissions of air pollutants in the "south County"— an area which was taken to include the Evergreen and Coyote Valley areas of San Jose and to extend southward to the County line. The estimates are that by 2010 the vehicular emissions of carbon monoxide and other criteria pollutants or precursors in the south County would be substantially diminished, in spite of the cumulative effects of foreseen growth.[14]

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14 Santa Clara County Transportation Plan T2010 Draft Environmental Impact Report, Santa Clara County Transit District, August 1991

In Morgan Hill the County's estimates are relevant to ozone and its precursors, for these pollutants are transported horizontally over distances of tens of miles during pollution episodes. It is a phenomenon which is regional in scope, which involves the entire County. Consequently the proposed Hayes Valley Plan could not significantly affect concentrations of ozone and its precursors in Morgan Hill, for emissions associated with the Hayes Valley Plan are slight in comparison to the sum total of the emissions which develop into the concentrations that are found in the south County, and, the cumulative emissions of the south County are expected to diminish in spite of vigorous growth in the population.

CONSTRUCTION

The most noticeable effect of construction activities on air quality would be that of dust being raised by the hauling, filling and grading needed to create the golf course, the pads for the new homes and the bases for the new driveways and roadway improvements.

Some dust would become airborne directly from those activities, but other dust would be raised because dirt would be tracked onto roadways where it would be pulverized and thus suspended in the air as fine particles.

The likelihood is that, because of the construction activities, concentrations of airborne particles would temporarily exceed the State's criterion for acceptable ambient air quality in the immediate vicinity of the construction sites. However, the ambient air quality standards are not intended to be directly applied to construction impacts at a given site, as such impacts are temporary and localized. Instead, the BAAQMD has an "opacity rule" which sets a permissible limit to the amount of dust that can be raised at any site. It is not possible to forecast whether or not the limit could be exceeded at a particular site, as it is primarily a question of compliance with the law, but the limit could also conceivably be inadvertently breached under some unusually adverse soil and wind conditions. If the rule were to be violated then the District could force the construction contractor to undertake measures to abate the emissions.

The Santa Clara County Grading Ordinance would require the developer to submit plans which incorporate provisions to abate erosion of slopes and other surfaces. The office of the County Surveyor enforces the ordinance.

LACK OF NEED

The foreseeable air quality impacts of the project have been found to be insubstantial, on all fronts. Consequently the public policy which flows from the California Environmental Quality Act and the State and Federal clean air acts is such that no air quality mitigation is required for this development.

INTRODUCTION

It is stated above that air quality mitigation measures for the Hayes Valley Plan are not warranted by public policy. Nonetheless, this addendum describes measures which might reduce the insubstantial effects that the development would have on air quality.

DUST CONTROL

Caltrans has several applicable policies for dust abatement during roadway construction.[15] The policies can also serve as a model for dust control at other types of projects, such as the construction of a golf course. There are far-reaching measures such as the use of special contract provisions to require that borrow pits and temporary haul roads be restored to a condition such that their potential as sources of blowing dust or other pollution is no greater than that of their original condition. The checklist of on-site measures includes provisions for temporary erosion protection with mulches, fiber mats, dust palliatives, etc, and for timely planting of slopes to permanently abate wind erosion, etc. The section of Caltrans's "Highway Design Manual" which is cited in the footnote is applicable during the design phase, at which time appropriate measures could be specified and written into the construction contracts.

It may be feasible to pave the driveways to the homes or to the golf course first, so as to reduce the amount of mud that is tracked onto the more frequently-travelled adjacent roadway, on which mud should not be allowed to accumulate. Washing or sweeping the roadway may be necessary. During those phases of the construction period when there is a substantial amount of exposed earth, the construction contractor should be required to have on the site a water truck or other means of readily watering exposed surfaces. Whenever dust is visibly being blown offsite the contractor should take action.

[15] "Highway Design Manual", Caltrans, fifth edition, §110.3

The following other measures or conditions would have a favorable effect on dust and could taken as obviating the need for watering on some portions of the site: (1) if weed control is needed, mow or flail rather than disk-under; (2) seed and water inactive portions of the site until grass growth has taken hold; and (3) refrain from grading, earth-moving or excavation activities during periods of high winds unless the earth is too damp to give off dust that could become airborne.

OTHER MITIGATION

Any intersection improvements which are undertaken so as to reduce delay at intersections would tend to reduce idling emissions there. It is thus likely that such improvements would improve the air quality in the immediate vicinity of the intersection.

Fireplace emissions can be reduced by simply selecting efficient designs. For example, there are fireplace inserts which reduce emissions and improve fuel efficiency without blocking the view of the fire. The US Environmental Protection Agency certifies fireplace inserts and woodstoves for energy and air quality efficiency. The certified woodstoves are of several designs. Some incorporate catalytic converters, others secondary combustion chambers, etc. The sale of new woodstoves and fireplace inserts which are uncertified is now prohibited.

MITIGATION MONITORING

If the above measures were to be adopted, they could be monitored. Obviously, there would be direct participation of the County's planning, building inspection and public works departments in the implementation of the site plan, in home construction, and in the construction of the proposed roadway improvements.

The implementation of the dust control measures could be monitored—albeit on an irregular basis— by the County's building code compliance staff. The measures could be taken to be conditions for approval of the project. If, under extreme conditions, the "opacity" rule of the BAAQMD which pertains to airborne dust were to be violated, the District could take direct action against the building contractor.

APPENDIX K

Hazardous Materials Report

Prepared by

Applied Geosciences, Inc.

August 1995

Copy No. _____

8 August 1995

PRELIMINARY SITE ASSESSMENT
200 ACRES OF PARTIALLY DEVELOPED LAND
785, 930 AND 1005 HIGHLAND AVENUE
SAN MARTIN, CALIFORNIA

Prepared for:

HAYES VALLEY DEVELOPMENT PARTNERS
405 El Camino Real, Suite 127
Menlo Park, California 94025

by:

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8 August 1995
L953284

Hayes Valley Development Partners
405 El Camino Real, Suite 127
Menlo Park, California 94025

Attention: Mr. Tom Hix

SUBJECT: PRELIMINARY SITE ASSESSMENT FOR APPROXIMATELY 200 ACRES OF PARTIALLY DEVELOPED LAND LOCATED AT 785, 930 AND 1005 HIGHLAND AVENUE, SAN MARTIN, CALIFORNIA

Dear Mr. Hix:

Applied Geosciences Inc. is pleased to submit this Preliminary Site Assessment (PSA) for approximately 200 acres of partially developed land at 785, 930 and 1005 Highland Avenue, San Martin, California (site), dated 21 July 1995. The work was conducted in general accordance with Proposal No. 95P5480, to the contract between Hayes Valley Development Partners and Applied Geosciences Inc. dated 26 June 1995.

Applied Geosciences Inc. appreciates the opportunity to assist Hayes Valley Development Partners with this environmental project. If you have any questions regarding this report, please feel free to contact the undersigned at your convenience.

Very truly yours,
APPLIED GEOSCIENCES, INC.

WILLIAM G. THEYSKENS
Senior Project Geologist

NICOLE M. FOURCADE
Assistant Staff Geologist

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200 ACRES OF PARTIALLY DEVELOPED LAND
785, 930 AND 1005 HIGHLAND AVENUE
SAN MARTIN, CALIFORNIA

1.0 INTRODUCTION

Applied Geosciences Inc. has conducted this Preliminary Site Assessment (PSA) for the approximately 200 acres of partially developed land at 785, 930 and 1005 Highland Avenue, San Martin, California (site). Based on our discussions, it is the understanding of Applied Geosciences Inc. that this investigation is being requested pursuant to the potential development of a golf course and a residential community on the Hayes Valley Property, by the client. According to preliminary information provided to Applied Geosciences Inc. by Bert Verrips, the Hayes Valley Property covers approximately 1,700 acres. Of the 1,700 acres, approximately 1,500 acres are a valley and hillsides which are predominately grazing land and forested acreage, approximately 32 acres is an old walnut orchard, approximately 144 acres includes cultivated fields and row crops, and approximately 24 acres of a farm/ranch complex (Verrips, 1995). There are twenty-two farm/ranch buildings associated with the farm/ranch complex, which consist of three residential structures, barns and sheds. The portion of the Hayes Valley Property for which this PSA is being performed consists of a 32-acre walnut orchard, 144-acres of historically cultivated fields and 24-acres of a farm/ranch complex (site) (Verrips, 1995). The work was conducted during the period of 26 June 1995 to 7 July 1995 in general accordance with Proposal No. 95P5480, to the contract between Hayes Valley Development Partners and Applied Geosciences Inc. dated 26 June 1995, and at the request and by the authorization of Mr. Tom Hix of Hix-Rubenstein Companies.

2.0 OBJECTIVE

The objective of this PSA was to identify to the extent feasible pursuant to the processes prescribed herein, the presence of Recognized Environmental Conditions (RECs), as defined in the American Society of Testing and Materials (ASTM) Standard E 1527-94.

3.0 APPROACH

The approach used to meet the objective was to conduct a site and site vicinity reconnaissance, review readily available information and historical aerial photographs, hold discussions with personnel at regulatory agencies, and evaluate the data obtained.

4.0 SCOPE OF WORK

The scope of work used to meet the objective was in general accordance with ASTM Standard E 1527-94, and included review of the following readily available information sources:

Task 1: Site and Site Vicinity

- Discussions with personnel familiar with the site facility and review of site facility drawings;

- A site reconnaissance to look for evidence of present, past, or future operations that use or may have used potentially hazardous materials; and

- A site vicinity reconnaissance to compile a list of companies/businesses in the immediate site vicinity that are reported to use, or appear to use or produce, hazardous substances that in our judgment may adversely impact the site.

- Task 2: Historical

  - County of Santa Clara Planning and Development records regarding the site;

  - Sanborn Fire Insurance Maps of the site;

  - Historical aerial photographs. The review is intended to provide information on historical land use as it relates to potential sources of hazardous waste (e.g., landfills, sumps, gas stations that are no longer present, or facility changes); and

  - Client-furnished title report.

- Task 3: Agency Data

  For the site and a 1-mile radius of the site:

  - Lists maintained by the California Environmental Protection Agency (Cal-EPA) Department of Toxic Substances Control, Cal-Sites Annual Work Plan (AWP), and U.S. Environmental Protection Agency (EPA) National Priorities List (NPL) regarding State and Federal Superfund sites in the site vicinity;

  - Cal-Sites list (formerly the Abandoned Sites Program Information System [ASPIS]); and

  - EPA Resource Conservation and Recovery Information System (RCRIS), Resource Conservation and Recovery Act (RCRA) Treatment, Storage, and Disposal (TSD) facilities list.

  For the site and a 0.5-mile radius of the site:

  - State of California Water Resources Control Board (SWRCB) and/or California Regional Water Quality Control Board (RWQCB) lists regarding unauthorized releases from underground storage tanks (USTs);

  - California Integrated Waste Management Board (CIWMB) and/or County information regarding active, abandoned landfills, and transfer stations;

  - Oil and gas records regarding present or past oil field activities; and

- Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) list.

- RWQCB, spills, leaks, investigations, and cleanups (SLIC) list or equivalent;

- RWQCB and/or State Water Resources Control Board, Solid Waste Assessment Test (SWAT) Program list;

For the site and facilities located in the immediate site vicinity:

- Santa Clara County Fire Marshal's Office UST lists; and

- EPA RCRA Facilities and Generators list.

For the site:

- EPA Emergency Response Notification Systems (ERNS) list;

- Santa Clara County Department of Environmental Health- Division of Hazardous Materials Compliance regarding hazardous waste investigations and/or remediation for the site, if deemed necessary; and

- Information regarding the hydrogeology of the site and/or site vicinities using selected references.

- Task 4: Data Evaluation, Report Compilation, and Management

  - After completion of Tasks 1 through 3, the data will be evaluated and a summary report will be prepared.

5.0 SITE DATA

In the following discussion, the following terms are used accordingly:

- "Site" refers to the area within the approximate boundaries shown in Figure 2. The site boundaries were obtained from a number of site plot plans provided by Nolte and Associates, verbal communication with Bert Verrips and Art Doughtry, and observations made during the site reconnaissance;

- "Immediate site vicinity" refers to the properties immediately adjacent to the site that share a common boundary with the site (Figure 2);

- "Intermediate site vicinity" refers to the area within approximately a 1/2-mile radius of the site; and

- "Site vicinity" refers to the area within approximately a 1-mile radius of the site, as shown in Figure 1; and

- The term "hazardous" is used here in general accordance with its usage in Title 22, of the California Code of Regulations (CCR). The terms "hazardous materials" and "hazardous waste" are used interchangeably, and no legal distinction is implied between the two terms as used herein; and

5.1 Site Setting

The site is currently partially developed land which is proposed for a golf course and a residential community. The site is approximately 200 acres in size. Land surface elevation of the site varies between approximately 270 to 320 feet above mean sea level, in the eastern and western portions of the site, respectively (USGS, 1955a; USGS, 1955b). Based on observations made during the site reconnaissance, the site is bounded on the north by open hillsides, on the northeast by residences, on the east by Coolidge Avenue/Santa Teresa Blvd., Turlock Avenue, highland Avenue and agricultural fields, on the south by a farm/ranch with agricultural fields and a small vineyard, and on the west by the valley and hillsides of the Hayes Valley (Figure 1 and 2).

5.2 Geology and Hydrogeology

The site is located in the southwestern region of the Santa Clara Valley, which is located east of the Santa Cruz Mountains and west of the Diablo Range, in California. The Santa Cruz Mountains, which are a section of the Coast Ranges Geomorphic Province, show strong northwest trends, induced by faults such as the San Andreas and Calaveras faults. The Coast Ranges extend approximately 550 miles in length in the north and south direction (Norris and Webb, 1990). There are three springs located in the Hayes Valley, west of the site. The Hayes Valley drains to the east. The low lying portions of the site, which are currently used as an orchard, cultivated fields, and a farm/ranch complex, are underlain by alluvium. This alluvium is weathered, slightly consolidated and indurated alluvial fan deposits consisting of primarily of gravel and sand, with some silt (Helley, 1979).

The site is located within the Hayes Valley which is located in the Santa Clara Valley (USGS, 1955a; USGS, 1955b). Groundwater flow in the Hayes Valley, based on topography, is interpreted to be towards the east, while groundwater flow in the Santa Clara Valley, in the site vicinity, is to the south. Because no facilities within the site vicinity are reported to have conducted extensive groundwater investigations, a groundwater flow direction for the site cannot be referenced. Based on information supplied by the Santa Clara Valley Water District groundwater is at a depth of 15 to 40 feet below the ground surface (SCVWD, 1995). The groundwater gradient in the site vicinity to the east of the site is interpreted to be to the south in the general direction of the slope of the topography and the flow of Llagas Creek. However, based on the agricultural activities at the site and in the site vicinity, it is likely that local groundwater flow directions and depth vary considerably.

5.3 Historical Review

5.3.1 Aerial Photographs

Readily available aerial photographs of the site were reviewed to assess the historical land uses of the site and site vicinity that could have been sources of potentially hazardous materials. Aerial photographs were supplied by Pacific Aerial Survey located in Oakland, California. The available historical aerial photographs of the site from Pacific Aerial Survey dated from 1970. Earlier historical aerial photographs were not readily available. The photographs reviewed are as follows:

- 08-25-70 scale 1:48,000
- 12-17-75 scale 1:54,000
- 05-08-78 scale 1:33,500
- 05-16-80 scale 1:30,000
- 07-03-85 scale 1:36,000
- 06-30-88 scale 1:12,000
- 08-10-92 scale 1:12,000

Obvious indicators of potential sources of hazardous waste from land use, such as large above-ground storage tanks, sumps, pits, or landfills, were not observed at the site. The following discussion provides a chronology of apparent usage of the site and site vicinity developed from our interpretation of the aerial photographs. The site is subdivided into three portions for this review: the orchard, the agricultural fields, and the farm/ranch complex (Figure 2).

1970

Based on an interpretation of the selected aerial photographs taken in 1970, the orchard was observed to have well-developed trees and to be clear of extra vegetation. The southern third of the orchard was transversed by a creek that trends east-west. South of the creek was a farm residence and a large barn. The agricultural fields were observed to be used for hay farming as evidenced by aligned rows of material interpreted to be cut hay. A white line, that appeared to be a surface feature related to irrigation, was observed to run southward through the center of one of the fields. The farm/ranch complex was observed to consist of varying sized structures that were interpreted to be barns, farm residences, and sheds, as well as corrals. To the immediate north of the site was a farm residence and a small barn. To the west of the site, a tree and grass covered valley with surrounding hills, and without any observable structures, was observed. A group of structures were observed off-site, to the south of the agricultural fields, with more fields beyond. A scattering of farm residences and barns, with adjoining fields, were observed to the east and northwest of the site.

1975

Based on an interpretation of the selected aerial photographs taken in 1975, the site and site vicinity were observed to be very similar to the observations of the 1970 aerial photograph. The agricultural fields were observed to be divided into thirds, two were dark colored and one was light colored. To the north of the orchard was a dark rectangular strip with a white line down the center and further north was a new farm residence and a small square shed.

1978 and 1980

Based on an interpretation of the selected aerial photographs taken in 1978, the site and site vicinity were observed to be very similar to the observations of the 1975 aerial photograph. The farm/ranch complex was observed to have several new, small structures that were interpreted to be two sheds, two horse shacks, and two water troughs. To the south of the site more structures and objects were observed. A residential development was being built to the northeast of the site. To the east of the site a freshly plowed rectangle and five small white objects were observed. Based on an interpretation of the selected aerial photographs taken in 1980, the site and site vicinity were observed to have no significant changes

1985

Based on an interpretation of the selected aerial photographs taken in 1985, the site and site vicinity were observed to be very similar to the observations of the 1980 aerial photograph. The orchard was observed to be overgrown and thinned out in its northwest and southeast corners. Hay bails were observed throughout the agricultural fields, and the crop pattern was changed in the southwest corner. To the northeast of the large barn and south of the orchard, two long, white rectangular objects and approximately eleven smaller objects were observed. These objects were interpreted to be truck trailers, vehicles, and farm equipment. To the east of the site, the large barn was observed to have four small structures around it and the five small white objects were no longer present.

1988 and 1992

Based on an interpretation of the selected aerial photographs taken in 1988, the site and site vicinity were observed to be very similar to the observations of the 1985 aerial photograph. The farm/ranch activities near the structures appeared to have increased in the 1988 aerial photograph, as many small objects interpreted to be vehicles and farm equipment were observed. Based on an interpretation of the selected aerial photographs taken in 1992, the site and site vicinity were observed to be very similar to the observations of the 1988 aerial photograph. Fewer objects, interpreted to be vehicles, were observed on the site. The farm residences in the orchard had a new small shed near it. To the east of the site, further development was underway. Older buildings were observed to no longer be present, and were replaced by newer large barns and smaller buildings. Many vehicles were observed near these buildings.

5.3.2 Environmental Risk Information & Imaging Services Property Record Report (ERIIS)

According to ERIIS, Sanborn Fire Insurance Maps have not been produced for the area where the site is located. Correspondence with ERIIS reporting the lack of coverage has been included as Appendix A.

5.3.3 Previous Investigations

A report documenting a previous investigation of a portion of the site and the immediate site vicinity were made available to Applied Geosciences Inc. by Nolte and Associates. The portions of the site covered in the report included the farm/ranch complex, but did not include the orchard and the agricultural fields. The report was prepared by Terratech Inc. on 20 January 1988 (Pre-Purchase Site Assessment of Geologic Hazards, Groundwater Supply and Environmental/Toxic Contamination of the Hayes Valley). The following is an excerpt from that report:

Environmental/Toxic Contamination Assessment:

"1) Overall, the property appears to have been used in a "clean" manner in regard to hazardous materials and waste disposal. 2) Although it is possible that agricultural chemicals such as weed killers have been applied to areas on site, we have no reason to believe that the concentrations applied were significantly higher than the normal practice of other Santa Clara County ranches. Our general experience with similar sites suggests that agricultural chemicals and their degradation products would only remain in very low concentrations in the soil. The concentrations at this site would probably be well below hazardous levels. Accordingly, we believe there should be little concern over agricultural contamination at this site. 3) Concentrations of nitrate above drinking water standards may be present in the groundwater beneath this site. However, this is a common condition in the rural areas of the County and with proper water management practices there should not be significant concern for development. 4) The former underground gasoline storage tank was not closed in accordance with County regulations. The tank itself is subject to the disposal requirements set forth by the California Department of Health Services (DHS). Although there is no evidence to suggest that subsurface contamination is present around the former tank location, some exploration and testing would be prudent. 5) The isolated spots of surface hydrocarbon spillage that can be found around the ranch are typically evidence of low to moderate contamination, generally limited to the upper several inches of soil, and rarely hazardous; particularly when mass grading (or burial under fill) occurs. The relative concern for surface spillage is about the same as that for agricultural chemicals, and less than the concern for the underground storage tank. 6) It should be reiterated that some of the native bedrock beneath this site may contain asbestos. Although the typical volumetric percentage of asbestos found in local serpentinite bedrock has been found to be low, some degree of hazard does exist when ripping and grading rock containing asbestos."

Furthermore, this report stated that a UST was excavated in approximately 1988.

"There are numerous tanks of various size, shape and condition on the site. However, all of these tanks except for a small 500-gallon tank in the storage yard appear to have only been used for water storage. This latter tank, which is rusty but not perforated, was apparently used for underground storage of gasoline. According to Mr. Hayes, the tank had just recently been excavated and moved to its current (aboveground) location. When in use, the tank apparently had been located adjacent to the north side of the access road, just west of the ranch house driveway. Mr. Hughs told us he did not notice any soil contamination around the tank when it was being removed. However, a representative from the County Environmental Health Department did not observe the removal and no soil samples were collected for laboratory testing."

5.4 Site Reconnaissance

A site reconnaissance was conducted by personnel from Applied Geosciences Inc., accompanied by Mr. Art Doughtry, a representative of IBM, on 30 June 1995. Mr. Doughtry informed us that IBM owns only part of the farm/ranch complex, and could only show us their property. Mr. Bud Minkel, who leases the remaining portion from Hix-Rubenstein Companies, accompanied personnel from Applied Geosciences Inc. on a reconnaissance of the remainder of the site on 7 July 1995. The purpose of the site reconnaissance was to observe the present conditions with respect to the use, storage, and generation of potentially hazardous materials at the site. Photographs and details of the site have been included as Figures 3 through 6. For the following discussion, the property will be divided into two sections, the IBM property, and the Minkel ranch. A reconnaissance of the interiors of the residential structures was not performed as part of this investigation. The structures were observed to generally be constructed of wood.

IBM property:

The IBM property consists of the orchard, the agricultural fields, and the eastern part of the farm/ranch complex.

At the entrance to the property was a residential building and a barn. The address was 785 Highland Avenue. We were unable to observe the interior of the barn at the time of the site reconnaissance. Three propane aboveground storage tanks (ASTs) were observed to be stored, but not in-use, at the rear of the property. To the west of the residence and the barn was a large red barn that was reported to formerly be used for feeding cattle, but was currently being used to store hay. The central portion of the barn had a dirt floor, and the sides had concrete floors. An empty 55-gallon drum with a spigot was observed in the south-west corner of the barn.

Aboveground electrical lines were observed to transverse the site and terminate at three pole mounted transformers which were observed on one pole near the central portion of the farm/ranch complex. Secondary power lines then led to the two residential structures located in the central portion of the farm/ranch complex. The transformers supply power to the farm/ranch and to a water well. The transformers were observed to have a rusty color. The center transformer was observed to have a dark stain on the bottom of it. No numbers were visible on the transformers or the pole. PG&E was contacted regarding the manufacture and installation dates of the three pole-mounted transformers, but a response had not yet been obtained prior to the issuance of this report.

One 500-gallon gasoline portable AST was observed in the agricultural field near the north end of the old milk house (Figure 3A). Additionally, two 500-gallon portable ASTs, one diesel and one gasoline, were located north of the old milk house (Figure 3B). The contents of the three ASTs were interpreted to contain either diesel or gasoline based on the presence or absence of a filter on top of the tank. Those without filters were interpreted to be gasoline. No staining was observed on the tanks or on the ground near the three ASTs.

Mr. Doughtry from IBM, who is the caretaker of the property, stated that a UST was historically present and may have been located to the northwest of the old milk house, and south of the nearest residential structure (Figure 2). In the area where the UST was reported to be present there was no evidence of an excavation scar on the ground surface. This UST is not located in the same place as the UST reported by Terratech (Section 5.3.3). Mrs. Silva and Mr. William Silva were contacted regarding the location of the UST, and both stated that to the best of their knowledge there has never been a UST at the Hayes Valley Ranch. They reported that they have lived and worked at the ranch since the 1950's.

A wood-framed, approximately 600 square feet (s.f.) building, with a tin roof, was located in the central portion of the farm/ranch. This building was reported by Mr. Doughtry to be used historically for vehicle repairs and is referred to here as the repair shed. The floor was half concrete and half dirt. At the time of the site reconnaissance, two vehicles were observed in the building. One was an old spray rig, presumably used for pesticides, and the other an old tractor. Both vehicles were located on the dirt side of the building and had dark stains beneath them (Figure 4A). An old wooden rack was located against the back wall, on the concrete, and based on Applied Geosciences Inc. experience it may have been used for the storage of oil drums (Figure 4B). Dark stains were also observed on the concrete around the wooden rack and in the central area of the concrete pad.

To the south of the repair building was a small chicken coop. To the northeast of the repair shop were two permanent sheds (Figure 5A). The western shed had a concrete floor and was used to store personal goods. The eastern shed had a dirt floor, with two 1 foot by 3 foot concrete slabs and an old pump. The pump had dark stains on it and it was covered in cobwebs (Figure 5B). A white colored powdered substance was observed on the floor near the door. Between the two sheds was a water spigot that was operational. To the north of the two sheds was an old residential structure that contained two rooms and a bathroom. This structure was being used to store personal goods. To the east of this building and north of the milk house was a residential structure that was occupied. The address was 930 Highland Avenue.

A pump and well house, located beneath the pole-mounted transformers, was approximately 380 s.f and was constructed of concrete. The floor of the well was approximately 10 feet below ground surface (BGS) and was submerged under 2 feet of water. A large pipe led from the well house to the what appeared to be a storm drain or a dry well, which was only 3 to 4 feet deep. One active groundwater production well was reported to be located at the site. The location the active groundwater production well is unknown. Mr. Doughtry stated that a number of ASTs were historically located next to the pump and well house. The contents of the historic ASTs are unknown. No staining was observed on the ground in this area.

The old milk house had concrete floors and was historically used for milking cows. Behind the milk house was the cooler house, where the pumped milk was placed. Mr. Doughtry stated that the farm/ranch complex was present in the 1920's and was used as a dairy farm. To the southwest of the cooler house was a large white barn that was observed to be used to store bales of hay at the time of the site reconnaissance. On the west side of the barn was a concrete pad with farming equipment stored on it. One D7 Caterpillar tractor was observed to have an oil stain beneath it.

The agricultural fields were observed to be fallow. To the east of the old milk house were stacks of freshly bailed hay, as well as farming equipment and farming vehicles. The agricultural field was observed to have approximately seven steel posts trending north-south through the field (Figure 2). These posts were reported by Mr. Minkel to be used for flood irrigation. Test pits for a proposed leach field were located randomly throughout the fields. Mr. Doughtry stated that the agricultural fields have always been used for dry farming of hay for horses.

Mr. Doughtry stated that the walnut orchard was no longer harvested. The orchard was observed to be overgrown with weeds, the trees were untrimmed and many of the trees were dying.

Minkel Ranch:

The Minkel ranch consists of the western part of the farm/ranch complex, and it is our understanding that it is owned by Hix-Rubenstein Companies. Bud Minkel has leased the property for the past ten years. Mr. Minkel stated that although he does not live on the site, he grazes cattle in the Hayes Valley and stables horses there. This portion of the site was occupied by one residence with the address 1005 Highland Avenue. There was also three barns, a "squeeze chute", a weighing shed, two feed sheds and a tack house.

One of the barns, nearest the house, was observed to have a concrete floor and to be used for vehicle repairs, and the storage of personal goods, vehicles, farm equipment, hay and tools. One 55-gallon drum of oil, three 5-gallon cans of lubricant, one-half-gallon of used motor oil, batteries, grease guns, and oxygen and acetylene tanks for welding were observed to be stored in this barn (Figure 6A). To the west of this barn was a tack house with a concrete floor. It had stored in and on its porch small quantities of petroleum products (5-gallon containers labelled as diesel fuel and a few containers that appeared to contain waste oil). Small quantities of hazardous materials such as spraying oils, and automotive supplies such as anti-freeze, oil and fuel were also stored in the tack house. The porch of the tack house was used for storage of damaged personal goods, as well as two empty 5-gallon cans of gasoline and damaged farm equipment. The second barn, to the southwest of the house, was observed to be used to store hay. The third barn was used for feeding cattle. Horses were observed to be corralled outside of this barn and small feed shacks were observed in each corral.

A 1,000-gallon AST was located near the equipment storage area. The cap was off and what was judged to be a diesel odor was detected by personnel from Applied Geosciences Inc. Vegetation was growing around the AST. Staining was not observed on the AST or on the ground beneath the AST. Mr. Minkel reported that the AST had been on the site for approximately two years and that there are no USTs on the property currently or historically. An old water truck was observed in the equipment storage area.

One small shed was used as a "squeeze chute", which is a devise used to immobilize cattle for the purpose of giving shots, branding, and insecticide application to the cattle (Figure 6B). Three empty containers of "pour on insecticide" for cattle were observed to be stored on the concrete floor. The insecticide was used for killing lice and was labeled as permethrin (3-phenoxyphenyl) methyl +/-cis-trans-3-(2,2-dichloroethene)2,2-dimethylcyclopropanecaboxylate

1.0 %; inert ingredients 99%. Mr. Minkel stated that a small amount (approximately 1/4 cup) of the insecticide was poured over the backs of the cattle.

Evidence, other than that which is mentioned above, of USTs or ASTs, soil or surface discoloration, distressed vegetation, or other obvious indications of the presence of potentially hazardous materials released to the subsurface were not observed at the site.

5.5 Site Vicinity Reconnaissance

A reconnaissance of the site vicinity was also conducted 7 July 1995 by personnel from Applied Geosciences Inc. The purpose of the site vicinity reconnaissance was to observe recent land use and conditions in the site vicinity; to collect information concerning the name, types, and locations of selected businesses in the site vicinity; and to assess the locations of the businesses that, in the judgment of Applied Geosciences Inc., may use or store potentially hazardous materials and generate hazardous waste.

To the immediate north of the farm/ranch complex (site) and across the creek, was a piece of property owned by Mr. Robert and Royanne Ukestad. The addresses of their property was 1005 Highland Avenue (same as the Minkel Ranch). Mr. Bob Ukestad was contacted regarding the possible historic existence of a UST on the site. Mr. Ukestad stated that a UST was historically located on his property, but that he had removed it himself in approximately 1983 when he also removed the gas pump above it. The approximately 400-gallon UST was reported to have been located north of the creek and west of the Ukestads' concrete driveway by about 20 to 30 feet. Mr. Ukestad stated, that when the tank was removed the UST was empty, there where no visible perforations, and the soil did not appear to be contaminated. During removal of the UST the backhoe reportedly inadvertently hit the top of the UST and created a hole. At the time of the excavation, Mr. Ukestad reported that no permits were acquired and soil sampling was not conducted. At present, Mr. Ukestad has the UST stored aboveground in his equipment yard. This UST does not appear to be the same UST that was referenced in the report by Terratech (see Section 5.3.3).

The site is bounded on the northeast by a small orchard, and residential lots with small agricultural crops. To the east are a few farm ranches with large agricultural fields, and a commercial feed barn. To the south is a farm ranch that has agricultural fields, and a small orchard. To the west is a valley surrounded by predominantly mountainous areas which are open and used for cattle grazing.

6.0 REGULATORY AGENCY REVIEW

Publications, records, and documents from the agencies listed in the scope of work for this report were reviewed for this assessment, and/or personnel of the agencies were contacted. The site was not listed in any of the material reviewed for this assessment, nor were any other facilities listed within the site vicinity.

In general, only potentially hazardous materials released from facilities located approximately upgradient and within one-half a mile of the site, or immediately adjacent to the site, were judged to have a reasonable potential of migrating to the site. This judgment was based on the assumption that materials generally do not migrate very large distances laterally within the soil, but rather tend to migrate with groundwater in the general direction of groundwater flow. The regional groundwater flow direction in the site vicinity is interpreted to be to the south, however the Hayes Valley, immediately west of the site, drains to the east (USGS, 1955a; USGS, 1955b). It is our judgement, based on the topography of the site, that groundwater on-site, and in the immediate site vicinity, likely flows in an easterly to southeasterly direction.

6.1 National Priority List (NPL) Sites

Information contained in the National Priority List, a list of sites prioritized by the EPA for cleanup under CERCLA (Comprehensive Environmental Response, Compensation and Liability Act), indicated that the site is not listed as an active or proposed NPL site. Additionally, no active or proposed NPL sites exist within a 1-mile radius of the site (AIC, 1995).

6.2 Cal-EPA, DTSC Annual Workplan List

Information contained in the DOHS's Expenditure Plan for the Hazardous Substances Cleanup Bond Act of 1984, commonly referred to as BEP or California Superfund has been eliminated and is now incorporated into the Cal-EPA Annual Work Plan (AWP) List. Information contained in the AWP List indicates that the site is not listed as an active AWP site. Additionally, there are no listed active AWP sites within an approximate 1-mile radius of the site (AIC, 1995).

6.3 U.S. EPA, RCRIS, RCRA Treatment, Storage, and Disposal (TSD) Facilities

The RCRIS, RCRA TSD list is a database maintained by the EPA for facilities at which treatment, storage and/or disposal of hazardous waste takes place, as defined and regulated by RCRA. The site is not listed as a RCRA TSD facility. Additionally, there are no listed active AWP sites within an approximate 1-mile radius of the site (AIC, 1995).

6.4 Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS)

CERCLIS is a database maintained by the EPA of potentially hazardous waste sites that have come to the attention of the EPA. Sites on the CERCLIS list are not necessarily hazardous waste sites but are sites that the EPA plans to investigate in the future, or has already investigated. The site is currently not a CERCLIS site. No other facilities in the site vicinity were listed on CERCLIS (AIC, 1995).

6.5 State Water Resources Control Board SWAT List

The site is currently not listed with the State Water Resources Control Board (SWRCB) Solid Waste Assessment Test (SWAT) Program list (1989). The SWAT list is a list of sites prioritized by the State which had formerly been used for waste disposal. The SWAT program involves an evaluation of these sites in regards to the likelihood that they are or have contributed to groundwater degradation. There are 26 ranked SWAT facilities located in Santa Clara County. The locations of these facilities are not readily available from the published list, nor from either the SWRCB or the RWQCB. However, many of these facilities are named according to the street or area for which they are located. Additionally, Applied Geosciences Inc. reviewed the computer database supplied by the SWRCB, which includes more detailed locations for some of the SWAT facilities. Based on review of this information, it is the judgment of Applied Geosciences Inc. that the site is not listed as a SWAT facility and that none of the ranked facilities are likely to be within a 0.5-mile radius of the site (SWAT, 1989).

6.6 Oil, Gas, and Geothermal Drilling

The site is not located within the limits of a producing or abandoned oil, gas, or geothermal field (CADOG, 1987a and 1987b; Munger, 1990). Based on the information reviewed, exploratory wells are not reported to have been drilled on the site (CADOG, 1987a; 1987b).

6.7 Reported Release Cases

Information contained in the Fuel Leak Annual List, SLIC List, and the Hazardous Waste and Substance Sites List (HWSSL) reports that there are no facilities with a reported release of potentially hazardous materials located within a 0.5-mile radius of the site (AIC, 1995).

6.8 Landfills

Based on information contained in "Active Landfills" (CIWMB, 1986 and 1993a), "Closed and Inactive Landfills" (CIWMB, 1993b), "Listing of Proposed Facilities in SWIS" (CIWMB, 1993c) and "Transfer Stations, Composting Facilities, Material Recovery Facilities" (CIWMB, 1993d) there are no landfills, active, closed, or inactive, proposed landfills, or transfer stations, composting facilities or material recovery facilities reported to exist within a 0.5-mile radius of the site (AIC, 1995).

6.9 U.S. EPA, RCRIS, RCRA Generators List

The RCRIS, RCRA Generators list is a nationwide database created to maintain and regulate facilities that handle hazardous waste. The database replaced the Hazardous Waste Data Management System in September 1992 as the major system supporting the implementation of the RCRA. The site is currently not a listed RCRA generator (AIC, 1995).

6.10 Cal-sites

Cal-sites is a database maintained by the Cal-EPA of inactive and active cases of the site evaluation and/or site survey programs. This database is used as a tracking system for present and former sites by the Cal-EPA. The site is currently not a Cal-site facility and there are currently no facilities located adjacent to the site that are on the Cal-sites list (AIC, 1995).

6.11 U.S. EPA, Emergency Response Notification System (ERNS) List

The ERNS list is a national computer database and retrieval system used to store information on accidental releases of oil and hazardous substances. The information stored on this database is acquired through the National Response Center that tracks over 35,000 incidents per year. The information in this database is available from 1987. The site is currently not listed on the ERNS database (AIC, 1995).

6.12 California State Water Resources Control Board Registered Storage Tanks list

The California State Water Resources Control Board maintains a list of registered underground storage tanks for the county of Santa Clara. Currently the site is not listed as having a registered UST. Additionally, none of the properties adjacent to the site are registered as having USTs (AIC, 1995).

6.13 Santa Clara County Fire Department

According to Mr. Karl Schneider, Assistant County Fire Marshal of the Santa Clara County Fire Department (FD), their department does not maintain a file for the site.

6.14 Santa Clara County Environmental Health Department

According to Mr. Gordon McPhail of the Santa Clara County Environmental Health Department-Hazardous Materials Division (SCCEHD), his department does maintain a file for the site (McPhail, 1995). A letter issued by Woodward-Clyde Consultants to SCCEHD reported that a 350-gallon gasoline UST was removed on 25 June 1990 from 785 Highland Avenue (site) (Figure 2). The tank was reported to be observed to be in good condition. Two soil samples were taken from the bottom of the excavation pit. The soil was found to contain total petroleum hydrocarbons, benzene, ethylbenzene, and total xylenes below the laboratory detection limits. Toluene was detected only slightly above the laboratory detection limit [0.005 milligrams per kilogram (mg/kg)] at 0.0078 mg/kg, and 0.0051 mg/kg (Woodward Clyde, 1995).

6.15 Santa Clara County Building and Planning Department

The information contained in the Santa Clara County Building and Planning Department for the site was reviewed by personnel from Applied Geosciences Inc. The Santa Clara County Building Department had no building permits available for the site. The Santa Clara County Planning Department did not have any permits or information in the file that referred to the installation or repair of below grade plumbing, sumps, clarifiers or other structures commonly associated with the storage and/or disposal of hazardous wastes. The file contained preliminary plot maps of the proposed residential community, golf course and support facilities along with correspondence between various county agencies and the owner regarding the proposed project. Several reports were present in the file by a number of consultants pertaining to different aspects of the proposed project. These reports addressed the issues of cultural resources, biological resources, traffic, removal of prime farm land, geotechnical and geologic feasibility, water supply, and site drainage.

6.16 Santa Clara County Agricultural Department

According to Mr. Eric Wylde of the Santa Clara County Agricultural Department (SCCAD), they have one application for the site (Wylde, 1995). The application is a Monthly Pesticide Use Report which states that Mr. William and Louis Silva reported in 4 April 1995 that they used MCPA-4 Amine and Buctril herbicides on 15 acres of oats. Mr. Wylde stated that Mr. Minkel did not report any usage of pesticides or herbicides on his portion of the Hayes Valley property (Wylde, 1995).

7.0 DISCUSSION

Historic on-site:

The agricultural fields have reportedly been historically used for oat and hay farming. In 1995 Mr. Silva reported to the SCCAD that he was using herbicides on 15 acres of oats (see Section 6.16). Additional details regarding the actual historical use of the agricultural fields are unknown. However, farming operations could have involved the use and disposal of potentially hazardous materials. Typically, activities such as pest and weed abatement procedures involve a number of potentially hazardous materials such as fuel hydrocarbons and other petroleum hydrocarbons, solvents, and herbicides and pesticides. Land use in the site vicinity has been predominantly agricultural. Farm/residence structures are known to have been historically, and are currently, present at the site. It is the experience of Applied Geosciences Inc. that potentially hazardous materials in the form of fuels, oils, solvents, and pesticides could have been used and/or stored in or around agricultural-related structures. Information pertaining to the use of these materials at the site, other than the specific herbicides previously reported, were not readily available in any regulatory records reviewed for this investigation. Because the historical usage of the agricultural field and the farm/ranch complex (site) could not be directly observed, a judgment regarding the likelihood that potentially hazardous materials are present in the subsurface of the site from uses of the agricultural field and the farm/residence cannot be made.

The orchard has reportedly been historically used for the harvesting of walnuts. Details regarding the actual historical use of the orchard is unknown. However, orchard operations could have involved the use and disposal of potentially hazardous materials. Typically, activities such as pest and weed abatement procedures involve a number of potentially hazardous materials such as herbicides and pesticides. Except for organochlorine pesticides, most pesticides and herbicides decompose rapidly in soil and are relatively immobile. Organochlorine pesticides were commonly used on orchards. Based on our experience, there is a moderate to high likelihood that pesticides and/or herbicides would have been used on the orchards grown at the site. Therefore, based on the historical information regarding the site, it is the judgement of Applied Geosciences Inc. that there is a moderate to high likelihood that potentially hazardous materials in the form of pesticides or herbicides are present in the shallow subsurface of the site from historical uses of the site. However, based on our experience, it is expected that if pesticides and/or herbicides are present, the concentrations would be low.

Three residential structures are currently located at the site. A fourth one has historically, and is currently, being used for storage. Based on the age of the structures, it is the judgement of Applied Geosciences Inc. that construction materials used for these structures are likely to contain asbestos.

The repair shed and the easternmost barn on the Minkel property have historically been used for minor repairs of vehicles. This type of activity could have resulted in the spillage or leakage of motor oil, motor fuel, solvents, and battery acid. Dark stains were observed beneath a tractor on the dirt side of the repair shed, as well as beneath a tractor located on a concrete pad near the milk house. These stains were observed to heavily coat the tractors and the ground surface below. These stains were judged to be oil and would, in our judgement, constitute a recognized environmental conditions (REC).

Mr. Doughtry stated that there had been ASTs located along the north edge of the pump house, that are no longer present. There was no evidence of staining on the ground in the vicinity of the former ASTs. However, spillage from refueling of the ASTs, as well as leaks from the ASTs, may have occurred historically.

A UST was reported by Mr. Doughtry to have been historically present on the site between the old milk house and the residence to the immediate northeast. A report issued by Terratech, dated 20 January 1988, stated that a UST excavated in around 1988 was located adjacent to the north side of the access road, just west of the ranch house driveway. The SCCEHD reported that a UST was removed from the site in June 1990. This UST was reported to be located at the rear of the house located at 785 Highland Avenue. Contrary to these reports, William Silva, Mrs. Silva, Robert Ukestad and Bud Minkel, who have all resided and/or worked portions of the Hayes Valley Ranch for 10 to 40 years, stated that to the best of their knowledge there has never been a UST on-site. Based on the previously cited information, it is the judgement of Applied Geosciences Inc. that there may have been up to three USTs located historically on site and these USTs would constitute a potential REC.

Based on the historical information regarding the site, it is the judgment of Applied Geosciences Inc. that there is a low to moderate likelihood that potentially hazardous materials are present in the subsurface of the site from historical uses of the site.

Historic off-site:

Mr. Ukestad stated that a UST was historically located on his property, but that he removed it himself in approximately 1983 when he also removed the gas pump above it. When the UST was removed, Mr. Ukestad stated that there was no soil sampling conducted at the time of the excavation. There is the potential that spillage from refueling, as well as leaks in the UST may have occurred. This UST was reported to be located approximately 20 feet north of their access road and to the west of their driveway, which would place it approximately 20 feet from the site's northern property line. It is the judgement of Applied Geosciences Inc. that there is insufficient data to make a judgement regarding the likelihood that potentially hazardous materials from the historical presence of the UST on the Ukestad Ranch are present in the subsurface of the site.

Current on-site:

The agricultural fields are currently being used for oat and hay farming. Farming operations generally involve the use and disposal of potentially hazardous materials. Typically, activities such as vehicle maintenance, fuel storage for farm vehicles, and pest and weed abatement procedures involve a number of potentially hazardous materials such as fuel hydrocarbons and other petroleum hydrocarbons, solvents, and herbicides and pesticides.

A spray rig, presumably used for pesticides and herbicides, was observed in the repair shed. If pesticides were used in this rig, they had to be stored on-site. A storage location for pesticides or herbicides was not observed at the time of the site reconnaissance. Information on potential spillage, and leakage of the containers was not available.

Three 500-gallon portable ASTs were observed near the old milk house and one on the Minkel leased portion of the site. Of the three ASTs near the old milk house two stored gasoline and one stored diesel. The AST on the Minkel leased portion stored diesel and has only been on the site for approximately two years. No staining was observed on or around the rigs. Information on spillage, or leakage of the containers, which may or may not have occurred, was not available.

At the time of the site reconnaissance, personnel from Applied Geosciences Inc. did not observe any evidence of USTs on-site.

Small quantities of hazardous materials such as motor oil, motor fuel, anti-freeze, solvents, lubricants and batteries, were stored in the tack shed and the eastern most barn on the Minkel ranch. These quantities were judged to be about 55-gallons and would constitute an REC.

To the northeast of the repair shop were two permanent sheds. The one to the east had a dirt floor, with two 1 foot by 3 foot concrete slabs and an old pump on it. The pump was oil stained and covered in cobwebs. The pumps use is unknown, but it may have been used for water, oil, or the mixing of chemicals. A white powdered substance was observed on the floor near the door. This powder may have been an herbicide or a pesticide.

On the Minkel leased portion of the site, one small shed was used as a squeeze chute for pouring an insecticide over the cattle. Three empty containers of the "pour on insecticide" was observed to be stored on the concrete floor.

The repair shed and the eastern most barn on the Minkel property are currently being used for minor repairs of vehicles. This type of activity could result in the spillage or leakage of motor oil, motor fuel, solvents, and battery acid. Information on spillage, or leakage of the containers, which may or may not have occurred, was not available.

The three-pole mounted transformers located on the site may be PCB containing. PG&E was contacted regarding the manufacture and installation dates of the three pole-mounted transformers, but a response had not yet been obtained prior to the issuance of this report.

Based on the historical information regarding the site, it is the judgment of Applied Geosciences Inc. that there is a moderate to high likelihood that potentially hazardous materials are present in the subsurface of the site from current uses of the site.

Current off-site:

The site is located in a predominantly agricultural area of Santa Clara County. There are currently no facilities listed with regulatory agencies (Appendix A). Additionally, based on the information presented in Section 6 of this report, it is our judgment that there is a low likelihood that potentially hazardous materials from current off-site sources located within the site vicinity are present at the site or in the shallow subsurface of the site.

The judgments, conclusions, and recommendations described in this report pertain to the conditions judged to be present or applicable at the time the work was performed. Future conditions may differ from those described herein and this report is not intended for use in future evaluations of the site unless an update is conducted by a consultant familiar with environmental assessments and/or subsurface investigations. Use of this report is provided to Hayes Valley Development Partners solely for their exclusive use and shall be subject to the terms and conditions in the applicable contract between Hayes Valley Development Partners and Applied Geosciences Inc. Any third party use, including use by Client's lender, of this report shall also be subject to the terms and conditions governing the work in the contract between Hayes Valley Development Partners and Applied Geosciences Inc. Any unauthorized release or misuse of this report shall be without risk or liability to Applied Geosciences Inc.

Certain information contained in this report may have been rightfully provided to Applied Geosciences Inc. by third parties or other outside sources. Applied Geosciences Inc. does not make any warranties or representations, whether expressed or implied, regarding the accuracy of such information, and shall not be held accountable or responsible in the event that any such inaccuracies are present.

8.0 CONCLUSIONS

Based on the information presented in this report, current regulatory guidelines, and the judgment of Applied Geosciences Inc., the following conclusions have been made:

- We have performed a Phase I Environmental Site Assessment in conformance with the scope of work and limitations of ASTM Standard E 1527-94 for the property located at 785, 930 and 1005 Highland Avenue in San Martin, California. Any exceptions to or deletions from this practice are described in Section 4.0 of this report. This assessment has revealed the following evidence of Recognized Environmental Conditions in connection with the site:

    - Based on information available there is a low to moderate likelihood that potentially hazardous materials are present at the site due to current and historic on-site sources of hazardous substances, and it is our judgment that these on-site sources would constitute an REC at the site.

- Because the activities associated with the historical use of the agricultural fields, and the farm/ranch complex (site) could not be directly observed, a judgment regarding the likelihood that potentially hazardous materials are present in the subsurface of the site from uses of the farm/residence cannot be made.

- Based on the historical information regarding the site, there is a moderate to high likelihood that potentially hazardous materials in the form of pesticides or herbicides are present in the shallow subsurface of the site from historical uses of the site. However, based on our experience, it is expected that if pesticides and/or herbicides are present, the concentrations would be low.

- Based on the age of the structures, the construction materials used for these structures most likely contains asbestos.

- There is a low to moderate likelihood that potentially hazardous materials are present in the subsurface of the site from historic uses of the site.

- There is insufficient data to make a judgement regarding the likelihood that potentially hazardous materials from the historical presence of the UST on the Ukestad Ranch are present in the subsurface of the site vicinity.

- There is a moderate to high likelihood that potentially hazardous materials are present in the subsurface of the site from current uses of the site.

- There is a low likelihood that potentially hazardous materials from current off-site sources located within the site vicinity are present at the site or in the shallow subsurface of the site.

9.0 RECOMMENDATIONS

Based on the information obtained during this assessment, current regulatory guidelines, and the judgment of Applied Geosciences Inc., the following recommendations are made:

- If a greater degree of confidence is desired regarding the presence of asbestos at concentrations greater than one percent in building materials observed on-site, an asbestos survey including representative sample collection and analysis by polarized light microscopy (PLM) should be considered.

- Prior to the commencement of building demolition or renovation activities which would disturb ACMs, federal regulations pursuant to the National Emissions Standards for Hazardous Air Pollutants (NESHAPS - 40 CFR Parts 61 and 763) require inspection for the presence of regulated asbestos-containing materials (RACMs) which may be disturbed during such activities.

- If a greater degree of confidence is desired regarding the presence of potentially hazardous waste at the site due to current and historic on-site sources of hazardous substances, then soil sampling should be conducted at the site. The locations of soil sampling would include, but would not be limited to, the orchard, beneath the pole-mounted transformers, areas below existing ASTs, in the locations of historic ASTs and USTs, beneath any areas known to have or had storage of hazardous materials, and beneath any dark stains located on-site.

- If a greater degree of confidence is desired regarding the presence of potentially hazardous materials at the site due to current and/or historic off-site sources of hazardous substances, then soil sampling and/or groundwater sampling should be conducted at the site.

10.0 REFERENCES

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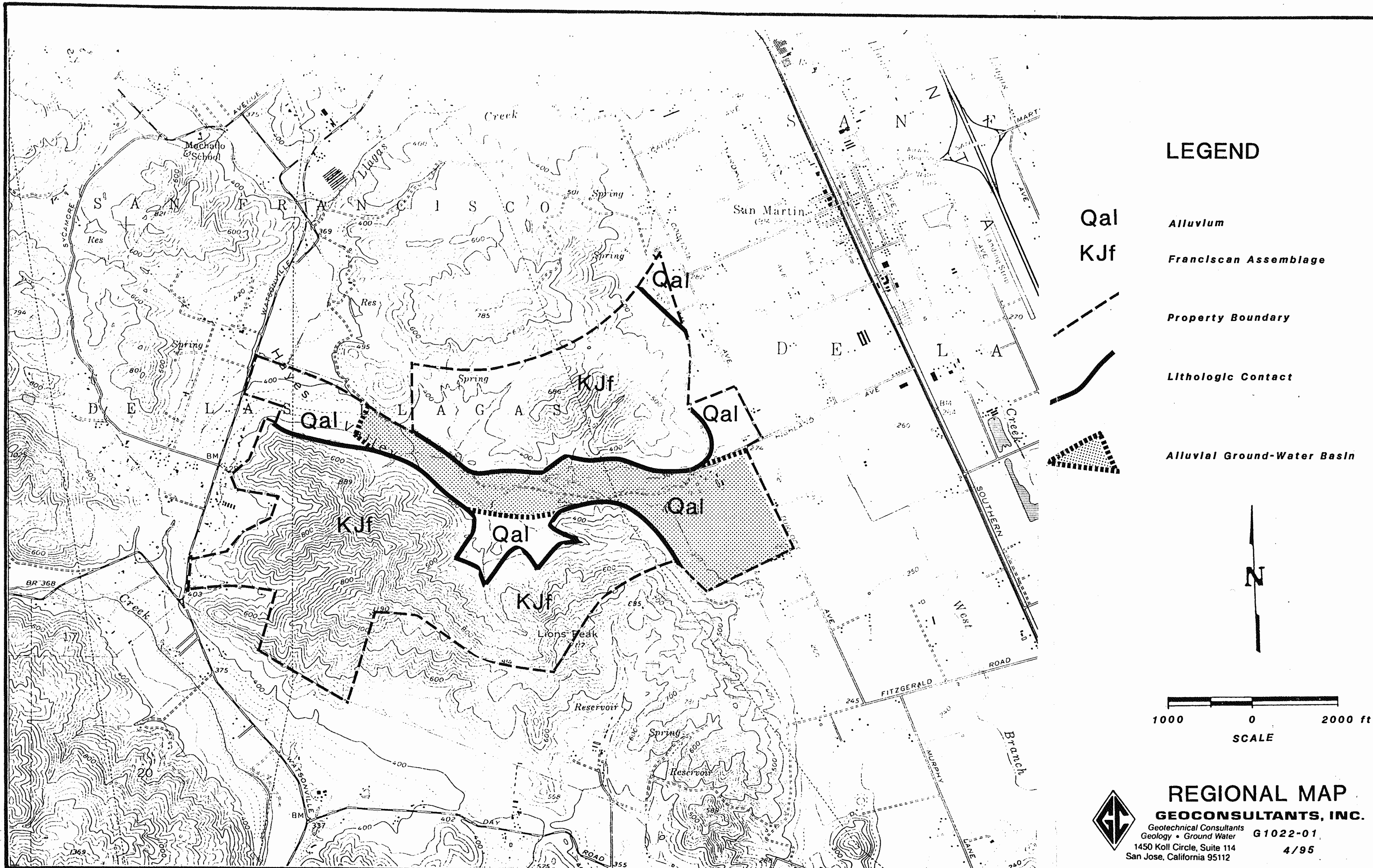
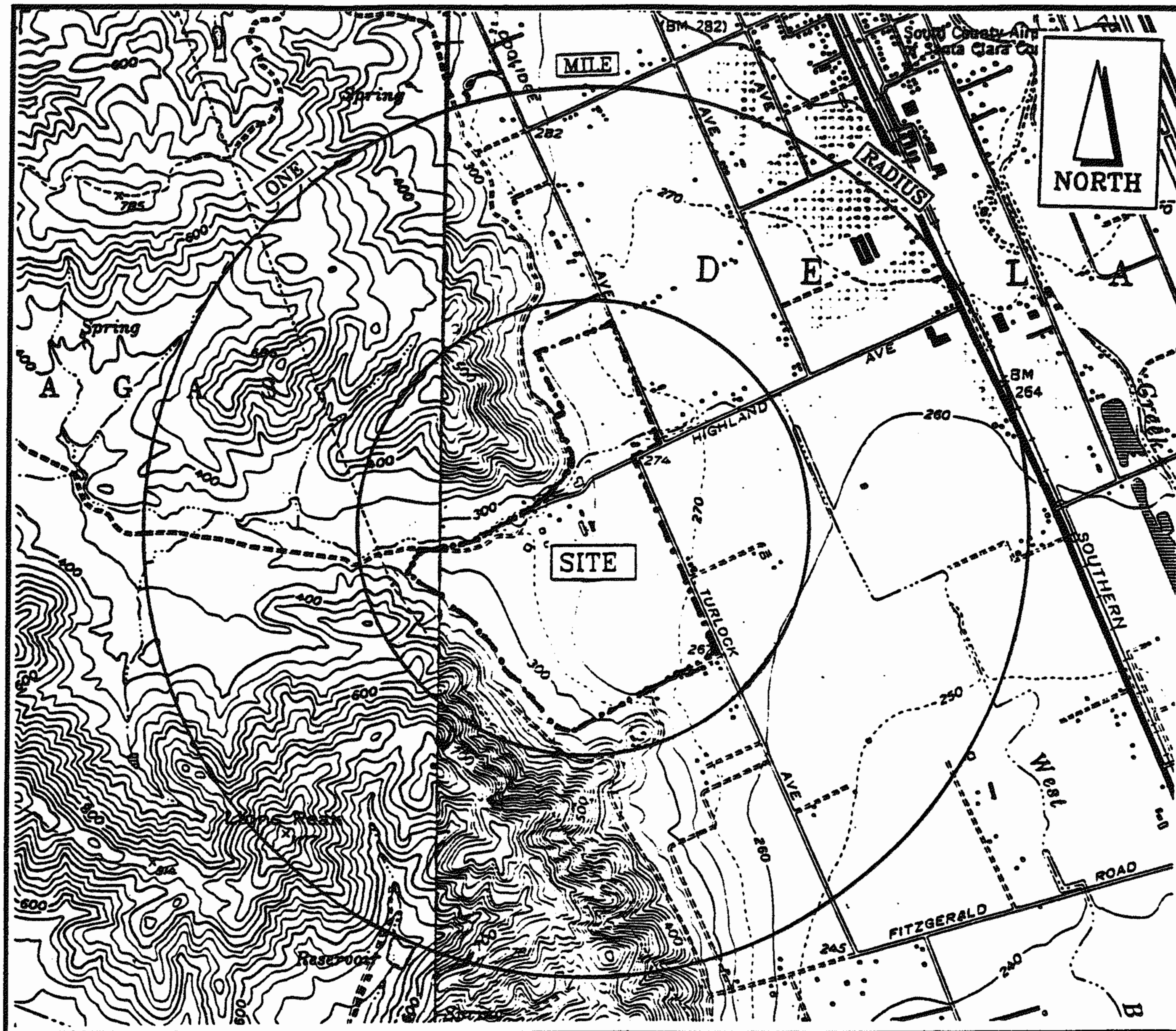
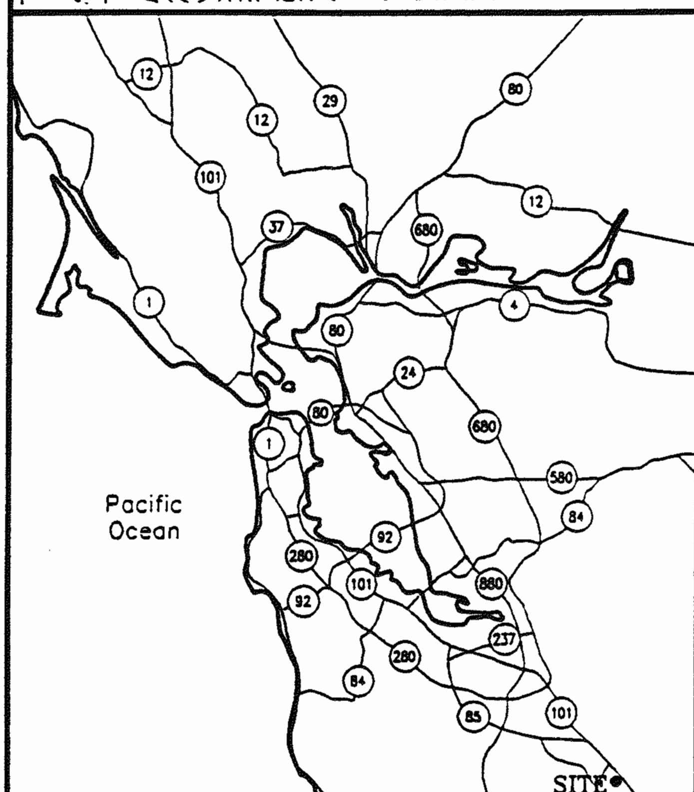


REGIONAL MAP
GEOCONSULTANTS, INC.
Geotechnical Consultants
Geology • Ground Water
1450 Koll Circle, Suite 114
San Jose, California 95112
G1022-01
4/95

FIGURE 1





Notes:

1) All locations and dimensions are approximate.

2) Base map from USGS Gilroy Quadrangle (1955), photorevised 1981 and Mt. Madonna Quadrangle (1955), photorevised 1980.

Explaination:

Site Boundary

0 1/4 1/2 1

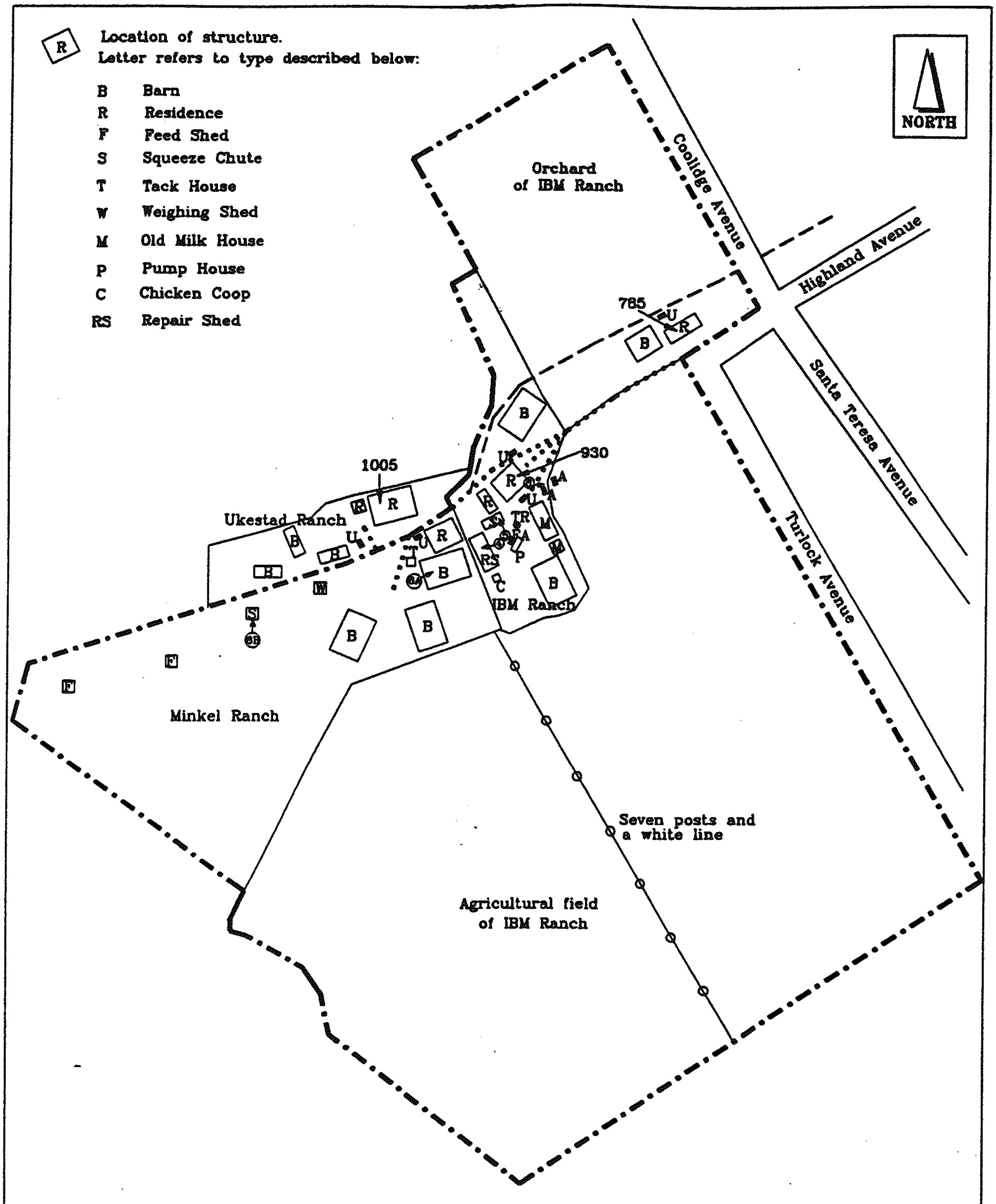
SCALE (MILES)

APPLIED GEOSCIENCES INC.

Environmental Consultants

SITE LOCATION MAP
HAYES VALLEY
SAN MARTIN, CALIFORNIA

PROJECT NO. L953284	FIGURE 1



Notes:

1) All locations and dimensions are approximate.
2) Base map adapted from Aerial Photograph, dated 10 August 1992.

0 40 600

SCALE, FEET

Explaination:

Site Boundary		A	Aboveground storage tank.
Creek		HA	Historic aboveground storage tank.
Access Road		U	Historic underground storage tank.
Photo locations		TR	Pole-mounted Transformers
785	Address of resident		

APPLIED GEOSCIENCES INC.
Environmental Consultants

SITE PLOT PLAN
HAYES VALLEY
785, 930 AND 1005 HIGHLAND AVENUE
SAN MARTIN, CALIFORNIA

PROJECT NO. L953284 | FIGURE 2

FIGURE 3A. VIEW OF ONE 500-GALLON PORTABLE AST IN THE HAY FIELD, WHICH CONTAINS GASOLINE.

FIGURE 3B. VIEW OF TWO 500-GALLON PORTABLE ASTs, NEAR THE OLD MILK HOUSE, WHICH CONTAIN GASOLINE AND DIESEL.

PROJECT NO. L953284
FIGURE 3

APPLIED GEOSCIENCES INC.
Environmental Consultants

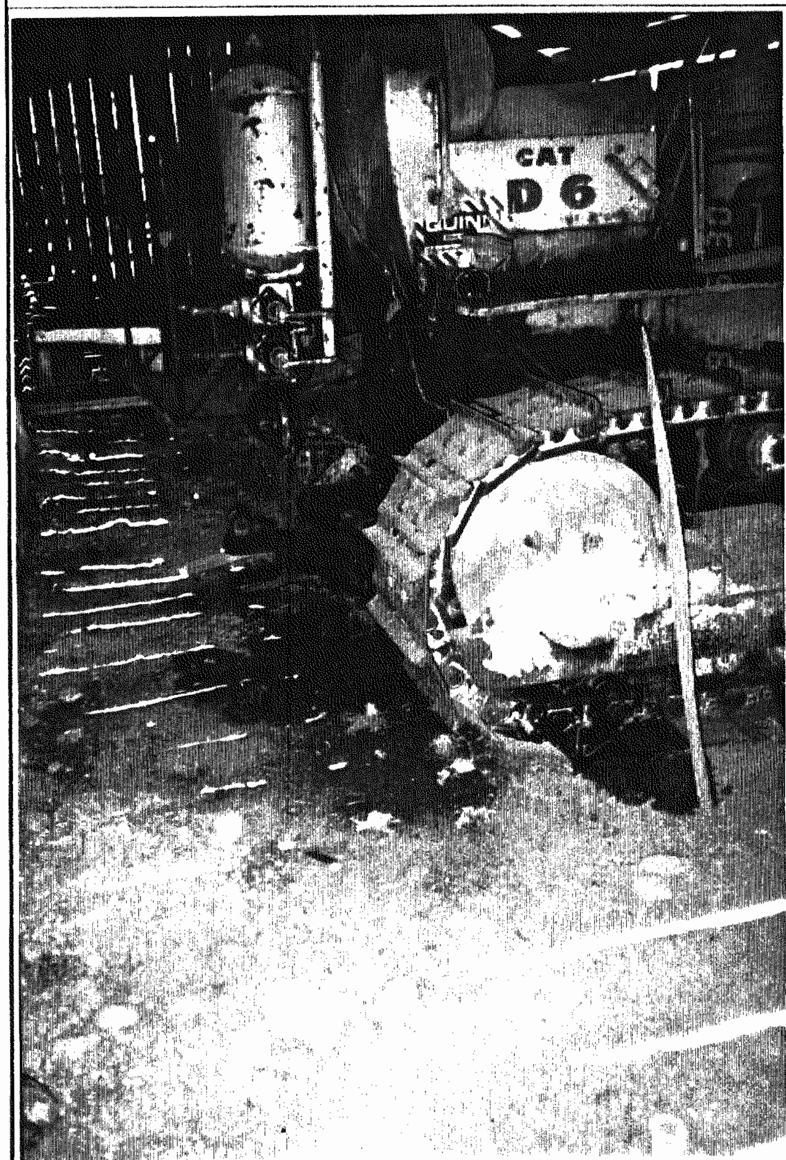


FIGURE 4A. VIEW OF DARK STAINS ON CONCRETE BENEATH A TRACTOR IN THE REPAIR SHED.

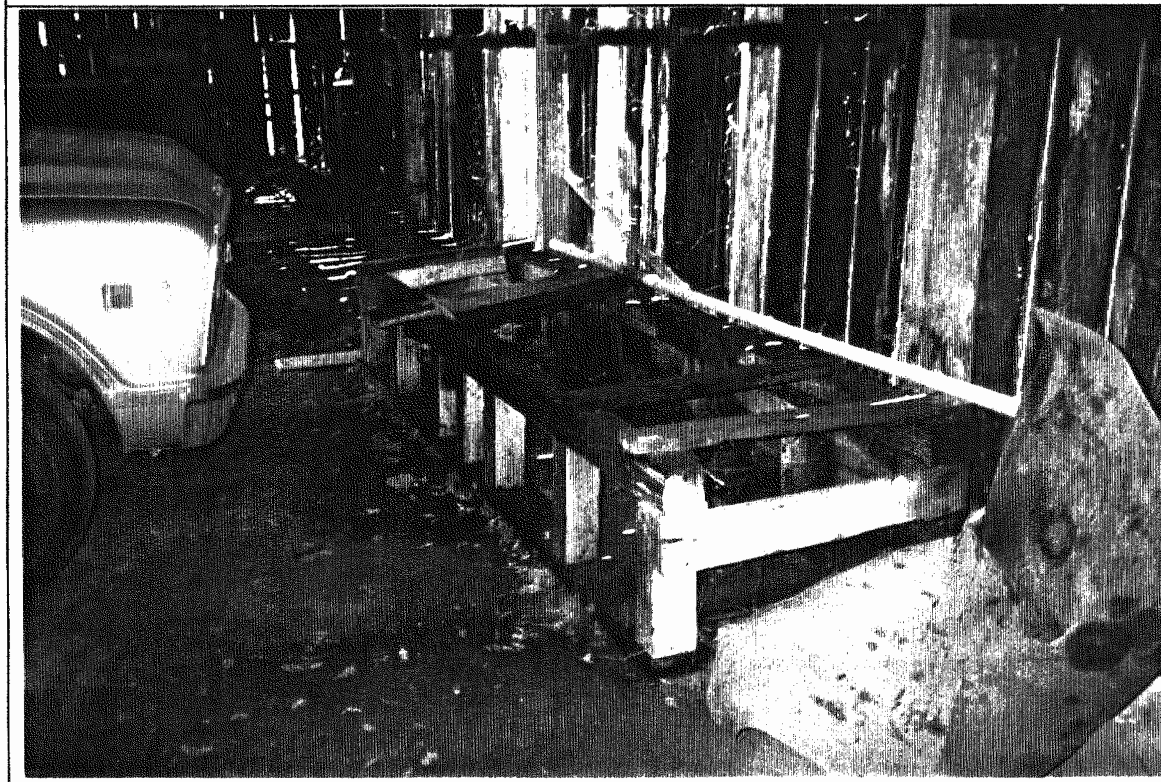


FIGURE 4B. VIEW OF DARK STAINS ON CONCRETE BENEATH A WOODEN FRAME IN THE REPAIR SHED.

PROJECT NO. L953284
FIGURE 4

APPLIED GEOSCIENCES INC.
Environmental Consultants

FIGURE 5A. VIEW OF TWO WOODEN SHEDS IN THE CENTRAL PORTION OF THE FARM/RANCH COMPLEX.

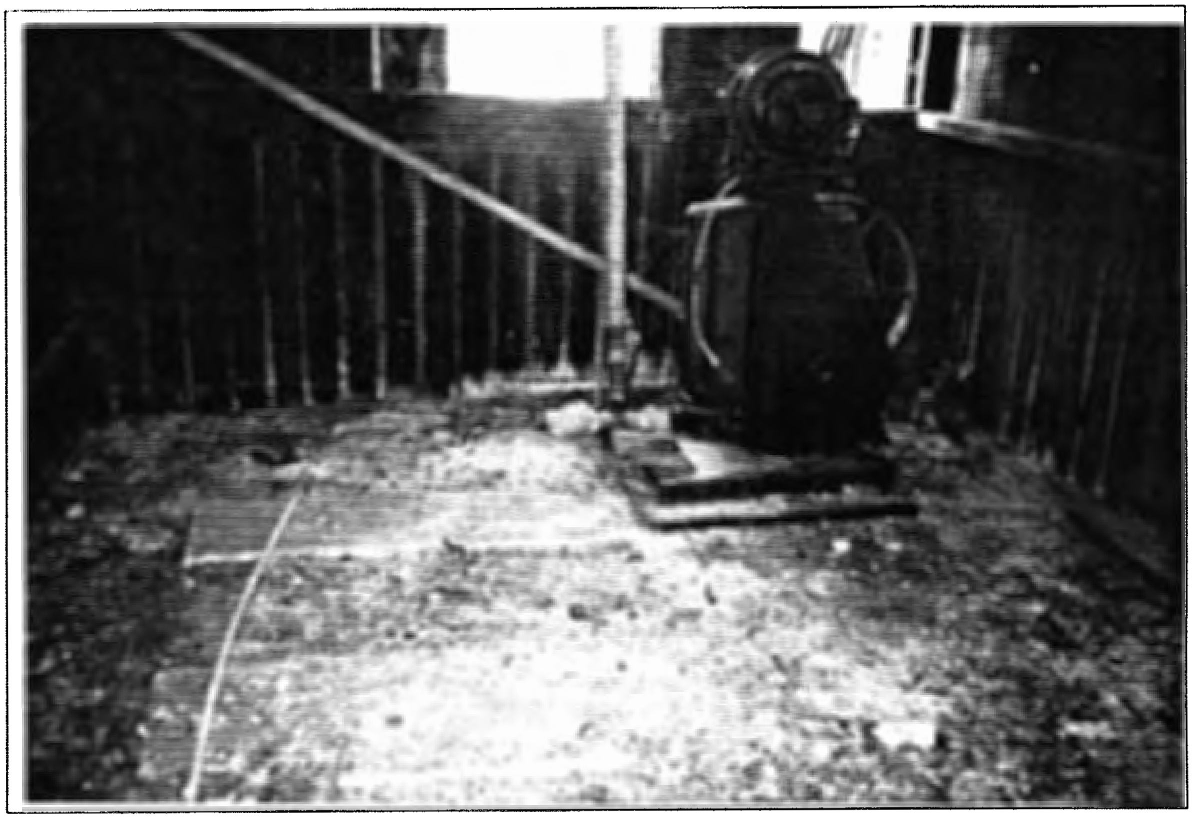


FIGURE 5B. VIEW OF AN OLD PUMP IN THE EASTERN MOST SHED.

APPLIED GEOSCIENCES INC.
Environmental Consultants

FIGURE 6A. VIEW OF FRESH AND USED OIL STORED IN A BARN LOCATED ON THE EAST SIDE OF THE SITE.

FIGURE 6B. VIEW OF A SQUEEZE CHUTE USED FOR PUTTING INSECTICIDES ON CATTLE, LOCATED ON THE EAST SIDE OF THE SITE.

PROJECT NO. L953284
FIGURE 6

APPLIED GEOSCIENCES INC.
Environmental Consultants

APPENDIX A

AGENCY INFORMATION CONSULTANTS RADIAL REPORT

Agency Information Consultants, Inc.

An ERIIS Company

AIC RADIAL REPORT

Job Number : 30-0043502

Subject Facility:

HAYES VALLEY

PROJECT # L953248PO # L9532~~4~~84

UNKNOWN

SAN MARTIN, CA 95046

Latitude :37.067153 Longitude :121.621249

Submitted

06/28/95

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505 Huntmar Park Drive, Suite 200, Herndon, VA 22070 Tel (800) 989-0402 Fax (703) 834-0606

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06/28/95

U.S. ENVIRONMENTAL PROTECTION AGENCY

CERCLIS Facilities

The Comprehensive Environmental Response, Compensation and Liability Information System(CERCLIS) is a compilation of records regarding those facilities which the EPA has identified as having actual or suspected uncontrolled releases of hazardous substances, contaminants, or pollutants as reported by states, municipalities, private companies, and private citizens. Each incident undergoes a series of events that determine the severity of the contamination from discovery and preliminary assessment to site inspection and possibly the hazard ranking system which will determine whether or not the site will be considered for inclusion on the NPL(National Priorities List).

NO SITES FOUND WITHIN AREA OF REVIEW

06/28/95

CALIFORNIA
Environmental Protection Agency
Department of Toxic Substance Control

State Sites

"List of Active Annual Workplan Sites(CALSITES)"

NO SITES FOUND WITHIN AREA OF REVIEW

06/28/95

U.S. ENVIRONMENTAL PROTECTION AGENCY

National Priority List

The NPL, or Federal Superfund as it is commonly known, is composed of the nation's most hazardous sites which require remediation. This list is created from the CERCLIS database and lists over 1150 sites nationwide. After a facility has been identified as a CERCLIS site, the EPA conducts an assessment of the property. The degree of contamination found determines whether the site is placed on the NPL or is referred to the state for further action under state programs(see State Superfund).

NO SITES FOUND WITHIN AREA OF REVIEW

06/28/95

U.S. ENVIRONMENTAL PROTECTION AGENCY

RCRIS Facilities

The Resource Conservation Recovery Information System(RCRIS) is a nationwide database created to maintain and regulate facilities that handle hazardous waste. The RCRIS database replaced the HWDMS (Hazardous Waste Data Management System) in September of 1992 as the major system supporting the implementation of RCRA(Resource Conservation and Recovery Act)

NO SITES FOUND WITHIN AREA OF REVIEW

06/28/95

CALIFORNIA
State Water Resources Control Board

Registered Storage Tanks

NO SITES FOUND WITHIN AREA OF REVIEW

06/28/95

CALIFORNIA
Regional Water Resources Control Board

Leaking Registered Storage Tanks

NO SITES FOUND WITHIN AREA OF REVIEW

06/28/95

U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Solid & Hazardous Waste

Emergency Response Notification System

The Emergency Response Notification System(ERNS) is a national computer database and retrieval system used to store information on accidental releases of oil and hazardous substances. The information stored in this database is acquired through the National Response Center that tracks over 35,000 incidents per year. A form is filled out for each incident that requires information such as: discharger name, date of release, amount released and type of substance released. The information in this database is available from 1987.

NO SITES FOUND WITHIN AREA OF REVIEW

06/28/95

CALIFORNIA
Integrated Waste Management Board
Clean Water Program

State Solid Waste Landfills

"Active and Closed Landfills (SWIS and SWAT)"

NO SITES FOUND WITHIN AREA OF REVIEW

APPENDIX

FACILITY ID	TYPE	FACILITY NAME	FACILITY ADDRESS	ZIP CD	FLAG
CAD980637722	CERCLIS	PACHECO PASS LDFL	0.7 MI NE OF BLOOMFIELD RD	95020	
CAD981416043	CERCLIS	PG&E GAS PLANT GILROY	6TH & RR ST	95020	
90-8979	ERNS	UNKNOWN		95020	
90-9718	ERNS	UNKNOWN		95020	
91-2312	ERNS	UNKNOWN		95020	
91-2379	ERNS	UNKNOWN		95020	
94-2362	ERNS	UNKNOWN		95020	
90-7135	ERNS	FARM LAND OIL		SAN M	
03126	ERNS			SAN J	
04719	ERNS			SAN J	
01891	ERNS			SAN J	
06671	ERNS			SAN J	
08799	ERNS			SAN J	
10741	ERNS			SAN J	
12029	ERNS			SAN J	
12868	ERNS			SAN J	
12871	ERNS			SAN J	
87-1782	ERNS	UNKNOWN/RECYCLING(UNIT)		SAN J	
87-1953	ERNS	GREAT WESTERN CIRCUIT BOARDS		SAN J	
87-1956	ERNS	UNK		SAN J	
87-2205	ERNS	(RP) C SOLVIG CO		SAN J	
87-2456	ERNS	UNKNOWN		SAN J	
87-2679	ERNS	UNKNOWN PERSON		SAN J	
87-2613	ERNS	UNKNOWN		SAN J	
87-3625	ERNS	UNK		SAN J	
13805	ERNS			SAN J	
14793	ERNS	UNKNOWN		SAN J	
87-4666	ERNS	UNK DUMPED		SAN J	
87-4835	ERNS	UNK DUMPED		SAN J	
87-4990	ERNS	UNK		SAN J	
88-170	ERNS	UNK (DUMPED)		SAN J	
87-4017	ERNS	UNKNOWN		SAN J	
87-4012	ERNS	UNK		SAN J	
87-4108	ERNS	UNK		SAN J	
87-4490	ERNS	UNK(DUMPED)		SAN J	
02000	ERNS	UNK		SAN J	
88-150	ERNS	UNK VEHICLE		SAN J	
88-251	ERNS	PRIVATE VEHICLE		SAN J	
88-273	ERNS	UNK TANK TRUCK		SAN J	
88-1599	ERNS	UNK DUMPED		SAN J	
88-2311	ERNS	UNK		SAN J	
88-3101	ERNS	UNK.		SAN J	
88-3174	ERNS	UNK.		SAN J	
88-3789	ERNS	UNK		SAN J	
88-3953	ERNS	UNK		SAN J	
88-4103	ERNS	UNK		SAN J	
88-4287	ERNS	UNK		SAN J	
88-4547	ERNS	UNK		SAN J	
00951	ERNS			SAN J	
89-218	ERNS	UNK		SAN J	
89-219	ERNS	UNK		SAN J	
89-260	ERNS	UNK		SAN J	
89-365	ERNS	UNK		SAN J	
89-367	ERNS	UNK		SAN J	
89-386	ERNS	UNK		SAN J	
89-1425	ERNS	UNK		SAN J	
89-1485	ERNS	UNK		SAN J	
89-1682	ERNS	UNK		SAN J	
89-1804	ERNS	UNK		SAN J	
89-1853	ERNS	UNK		SAN J	
89-2458	ERNS	UNK		SAN J	
89-3073	ERNS	MATLOCK TRUCKING		SAN J	
15475	ERNS			SAN J	
89-3171	ERNS	UNK		SAN J	
89-3327	ERNS	UNK		SAN J	
89-3374	ERNS	UNK		SAN J	
16731	ERNS			SAN J	
89-3600	ERNS	UNK		SAN J	
89-3726	ERNS	UN K		SAN J	

APPENDIX

FACILITY ID	TYPE	FACILITY NAME	FACILITY ADDRESS	ZIP CD	FLAG
89-3933	ERNS	UNK		SAN J	
18354	ERNS			SAN J	
18377	ERNS			SAN J	
18506	ERNS			SAN J	
19326	ERNS			SAN J	
90-6567	ERNS	CITY PUBLIC WORKS		SAN J	
90-6775	ERNS	CITY OF SAN JOSE		SAN J	
90-10064	ERNS	UNKNOWN		SAN J	
44694	ERNS	CHEVRON USA		SAN J	
91-0150	ERNS	UNKNOWN		SAN J	
91-0972	ERNS	UNKNOWN		SAN J	
91-2448	ERNS	UNKNOWN		SAN J	
69515	ERNS			SAN J	
91-3716	ERNS	UNKNOWN		SAN J	
91-4083	ERNS	UNKNOWN		SAN J	
77000	ERNS			SAN J	
92-1935	ERNS	UNKNOWN		SAN J	
92-2039	ERNS	UNKNOWN		SAN J	
92-3225	ERNS	UNKNOWN		SAN J	
92-3225A	ERNS	UNKNOWN		SAN J	
92-4688A	ERNS	UNKNOWN		SAN J	
217977	ERNS			SAN J	
234315	ERNS			SAN J	
88-4138	ERNS	UNK		SAN J	
88-4034	ERNS	SAN JOSE STATE UNIV P MOSS	1 WASHINGTON SQ	SAN J	
76496	ERNS	SOLVENT SERVICES	1021 BERRYESSA DR	SAN J	
88-4454	ERNS	USA PETROLEUM CORP	10901 E CAPITOL EXPRESSWAY	SAN J	
89-135	ERNS	VSLI TECHNOLOGY	1101 MCKAY DR	SAN J	
58560	ERNS	F.M.C. CORP	1125 COLEMAN AVE	SAN J	
53262	ERNS	FMC CORP.	1125 COLEMAN AVE BOX 367	SAN J	
88-2776	ERNS	FETZER VINEYARD	1150 DEL ARBRES RD	SAN J	
92-5215	ERNS	ARRAY TECH	1297 PARKMOOR AVE	SAN J	
87-3787	ERNS	GARY BROWN	1305 TILLMAN	SAN J	
90-6953	ERNS	CITY MAINTENANCE	1404 MABURY ROAD	SAN J	
88-2410	ERNS	SYNCOR INT'L	1445 KOLL CIRCLE	SAN J	
90-6715	ERNS	SANTA CLARA COUNTY TRANSIT	1555 BERGER DR	SAN J	
88-2869	ERNS	ALTUS BATTERY CO	1610 CRANE COURT	SAN J	
02251	ERNS	PACIFIC BELL	1615 FOXWORTHY AVENUE (ROOM 207	SAN J	
88-2507	ERNS	CAL-AIR (D. WYKOFF)	1625 ALAMEDA	SAN J	
87-3080	ERNS	(RP)EXXON (KENT SANDERSON)	1646 NO CA BLVD SUITE 210	SAN J	
88-2694	ERNS	PITZER AUTOMOTIVE	1660 MONTEREY HWY	SAN J	
87-2100	ERNS	(RP) UNOCAL (STATION)	1690 SARATOGA RD	SAN J	
08724	ERNS	PACIFIC GAS AND ELECTRIC	1864 SANTA TERASA DR	SAN J	
88-411	ERNS	A CLASSIC FINISH	1915 W SAN CARLOS	SAN J	
87-2256	ERNS	(RP)ALLIED OIL&PUMPING	2002 O'TOOLE	SAN J	
89-3470	ERNS	IRM CORP/MITCHELL P	2020 S 10TH ST	SAN J	
87-2530	ERNS	(RP)SANMINA (S.BRUTIN)	2101 OTOOL ROAD	SAN J	
90-7005	ERNS	UNITED VAN LINES	2138 O'TOOLE AVENUE	SAN J	
88-3156	ERNS	EXCEL MICROELETRONICS	2150 COMMERCE DR	SAN J	
87-2427	ERNS	(RP)SOUTHERN PACIFIC PIPE LN	2150 CRUZE DR	SAN J	
07463	ERNS	IT CORP	221 EAST D ST	SAN M	
39253	ERNS	CONNER PERIPHALS CO	2221 OLD OAKLAND RD	SAN J	
44344	ERNS	CONNER PERIPHERALS CO	2221 OLD OAKLAND RD	SAN J	
91-3151	ERNS	DINA VISION	2365 TRAGON DR BLDG E	SAN J	
73327	ERNS	GLASFORMS INC.	271 BERNARD AVE	SAN J	
88-4199	ERNS	SAN JOSE GENERATING PLANT	283 S 10TH ST	SAN J	
90-9628	ERNS	FMC CORP.	328 BROKAW RD	SAN J	
89-94	ERNS	HEWLETT PACKARD CO	350 W TRIMBLE RD	SAN J	
91-0854	ERNS	MOUNTAIN SIDE TRANSPORT, INC.	400 SLORIN-PERKINS	SAN J	
89-95	ERNS	LEASEWAY TRUCKING C WILLIAMS	4400 FLORIN PERKINS RD	SAN J	
88-221	ERNS	IBM *87	5600 COTTLE RD	SAN J	
88-4219	ERNS	ANO PIATE METAL FINISHING	568 CHARCOT AVE	SAN J	
87-1730	ERNS	UNITED TECHNOLOGIES	600 METCALF RD	SAN J	
89-214	ERNS	CENTRAL CONCRETE SUPPLY	610 MCKENDRIE	SAN J	
88-4070	ERNS	TOSHIBA R GUNDO	611 B RIVER OAKS PARKWAY	SAN J	
16020	ERNS	SOLVENT SERVICE, INC	660 LENFEST RD	SAN J	
16656	ERNS	SOLVENT SERVICE INC.	660 LENFEST RD	SAN J	
88-125	ERNS	SAN JOSE RADIATOR	665 LINCOLN	SAN J	
89-1660	ERNS	SANTA CLARA MED CENTER	751 S BASCOM AVE	SAN J	
88-3263	ERNS	BAY AREA MACK	757 COMMERCIAL ST	SAN J	

APPENDIX

FACILITY ID	TYPE	FACILITY NAME	FACILITY ADDRESS	ZIP CD	FLAG
89-1819	ERNS	DEPT PW SAN JOSE	801 N 1ST ST	SAN J	
89-914	ERNS	PORTOLA CLEANERS	805 STATE ST	SAN J	
64521	ERNS	EAST SIDE UNION HIGH SCH	830 N CAPITOL AVE	SAN J	
88-152	ERNS	SOUTHERN PACIFIC PIPELINE	888 S FIGUEROA ST	SAN J	
88-3801	ERNS	TERRA FAUNA G MCCARTHY	888 STOCKTON AVE	SAN J	
88-2916	ERNS	AMJRONICS	90 BONA VENTURA DRIVE	SAN J	
89-717	ERNS	BERGREN AUTO ELECTRIC	985 W JULIAN ST	SAN J	
09485	ERNS	LEVINE METAL CORP	BARNARD AVENUE	SAN J	
12504	ERNS	UNION 76	CORNER OF MORE PARK & WINCHESTE	SAN J	
88-4413	ERNS	USA GAS STATION	MCLAUGHLIN & CAPITOL EXPY	SAN J	
88-3527	ERNS	SIERRA PRECAST INC.	P O BOX 53207	SAN J	
87-4227	ERNS	G&H STEEL SERVICE INC.	PO BOX 27	SAN J	
11968	ERNS	UNITED TECHNOLOGIES CHEMICAL	PO BOX 49028	SAN J	
87-3652	ERNS	ECOLAB (ROGER KORTE)	PO BX 3175 640 LENFAST RD	SAN J	
09622	ERNS	UNITED TECHNOLOGIES	POB 49028	SAN J	
87-1862	ERNS	UNITED TECH CHEM SYSTEMS	POS BOX 50015	SAN J	
87-1983	ERNS	CITY OF SAN JOSE(G.LYNCH)	RM 460 801 NTH FIRST ST	SAN J	
219644	ERNS		SHELTON WAY	SAN J	4
CA_2CITYSAN	LRST	CITY SJ: PENITENCIA CREEK PAR		SAN J	
CA86D	LRST	FILICE ESTATE VINYARDS	10270 MONTEREY RD	SAN J	
CA_2COYO1084GIL	LRST	COYOTE LAKE PARK	1084 COYOTE LAKE RD	95020	
CA331	LRST	CAL TRANS-GILROY MAINT. STA.	11155 UNO ST	95020	
CA_2LICO1424SAN	LRST	LICO DISTRIBUTING	14245 MONTEREY HWY	95046	4
CA329	LRST	LICO DISTRIBUTING	14245 MONTEREY HWY	95046	4
CA_2SANJ1590SAN-2	LRST	SAN JOSE FIRE STATION #25	1590 GOLD ST	SAN J	
CA_2BPOI2000SAN	LRST	BP OIL	2000 EL CAMINO REAL	SAN J	
CA454	LRST	GILROY TRANSIT MIX, INC.	25 BUENA VISTA AVE	95020	2
CA_2THER2530SAN	LRST	THERMA INC	2530 LUNDY	SAN J	
CA_2ORIG3025SAN	LRST	ORIGINAL JOES	302 51ST ST	SAN J	
CA_2CITY320HSAN	LRST	CITY OF SAN JOSE	320 HARRON ST	SAN J	
CA_2FMCC333JSAN	LRST	FMC CORP, SJ ORDNANCE PLANT	333 JULIAN ST	SAN J	
CA_2ZYCO390BSAN	LRST	ZYCON CORPORATION PROPERTY	390 BELLOMY STREET	SAN J	
CA1064	LRST	CERTIFIED EGG	4140 CANADA RD	95020	4
CA327-2	LRST	FELICE, CRAIG	475 THOMAS LN	95020	4
CA_2BABB510OSAN	LRST	BABBAGE, POOLE & BABBAGE	510 OAKMEAD PKWY	SAN J	
CA_2CHEV5887GIL	LRST	CHEVRON	5887 MONTEREY RD	95020	4
CA790-1	LRST	CHEVRON SS#9-6293	5887 MONTEREY RD	95020	4
CA2441	LRST	FRANK VIGNA	670 DENIO AVE	95020	4
CA1077-2	LRST	SCVWD LLAGAS CRK	8255 CHURCH ST	95020	
CA786-1	LRST	GREEN VALLEY ENTERPRISES	8930 WATSONVILLE RD	95020	2
CA_2SOUT90STSAN	LRST	SOUTHLAND	90 STERN AVE	SAN J	
CA_2UNKN9605SAN	LRST	UNKNOWN	9605 MONTEREY HWY	SAN J	
CA_2SJRAMARKSAN	LRST	SJRA HOTEL EAST/CONVENTION CT	MARKET	SAN J	
CA_2FOSTMONTSAN	LRST	FOSTER GROUP PARTNERSHIP	MONTEREY RD	SAN J	
CA_2PACIMTUMSAN	LRST	PACIFIC BELL	MT UMHUMUM/HICKS RD	SAN J	
CA330-1	LRST	CAL TRANS MAINTENANCE STA. #2	PACHECO PASS HWY	95020	
CA_2SANTSANJSAN	LRST	SANTA FE PACIFIC PIPELINE	SAN JOSE TERMINAL	SAN J	
CA_2BENSSANTSAN	LRST	BENSEN PROPERTY	SANTA TERESA ST	SAN J	
CA_2GOLDSTEVSAN	LRST	GOLDEN WEST BUILDERS	STEVENS CRK	SAN J	
CA_2CANNTAYLSAN	LRST	CANNERY PARK	TAYLOR E	SAN J	
CA581	LRST	BARBERI PROPERTY-UVAS CREEK	THOMAS RD	95020	
CA43360089	NPL	FAIRCHILD SEMICONDUCTOR (S. S	101 BERNAL RD	SANTA	
CA43360032	NPL	INTERSIL	10910 N TANTAU AVE	SANTA	
CA43380014	NPL	MONOLITHIC MEMORIES	1165 E ARQUES AVE	SANTA	
CA43360084	NPL	SPECTRA PHYSICS, INC.	1250 W MIDDLEFIELD RD	SANTA	
CA43360082	NPL	TELEDYNE SEMICONDUCTOR	1300 TERRA BELLA AVE	SANTA	
CA43300026	NPL	LORENTZ BARREL & DRUM COMPANY	1515 S 10TH ST	SANTA	V
CA43280119	NPL	JASCO CHEMICAL CO	1710 VILLA ST	SANTA	
CA43350085	NPL	INTEL CORPORATION (SANTA CLAR	2880 NORTHWESTERN PKY	SANTA	
CA43360029	NPL	NATIONAL SEMICONDUCTOR CORP	2900 SEMICONDUCTOR DR	SANTA	V
CA43350086	NPL	INTEL MAGNETICS/MICRO STORAGE	3000 OAKMEAD VILLAGE DR	SANTA	
CA43360090	NPL	APPLIED MATERIALS	3050 BOWERS AVE	SANTA	
CA43990002	NPL	SYNERTEK, INC. (BUILDING 1)	3050 CORONADO DR	SANTA	
CA43360081	NPL	RAYTHEON CORPORATION	350 ELLIS ST	SANTA	
CA43350080	NPL	INTEL CORPORATION (MOUNTAIN V	365 E MIDDLEFIELD RD	SANTA	
CA43380013	NPL	FAIRCHILD SEMICONDUCTOR/MT. V	464 ELLIS ST	SANTA	
CA43350082	NPL	HEWLETT-PACKARD (620-640 PAGE	620 PAGE MILL RD	SANTA	V
CA43360094	NPL	TRW MICROWAVE, INC. (BUILDING	825 STEWART DR	SANTA	

APPENDIX

FACILITY ID	TYPE	FACILITY NAME	FACILITY ADDRESS	ZIP CD	FLAG
CA43360092	NPL	ADVANCED MICRO DEVICES, INC.	901 THOMPSON PL	SANTA	
CA43360095	NPL	ADVANCED MICRO DEVICES # 915	915 DEGVIGNE DR	SANTA	
CA43490060	NPL	SOUTH BAY ASBESTOS AREA	FT OF LIBERTY ST GUADALUPE RIV	SANTA	
CA43350001	NPL	WESTINGHOUSE ELECTRIC CORP. (	HENDY AVE & FAIROAKS AVE	SANTA	
CA43450001	NPL	MOFFETT NAVAL AIR STATION	MOFFETT FIELD (10 MILES NORTH O	SANTA	
CA43360083	NPL	CTS PRINTEX	PLYMOUTH & COLONY STS	SANTA	V
CAD124949496	RCRIS	KASTOR'S AUTO & TRUCK	13165 A MONTEREY WAY	95046	
CAT080010879	RCRIS	REPUBLIC POWDERED METALS INC	20 CASEY LN	95020	4
CAD980695381	RCRIS	LOOMIX INC	25 BUENA VISTA AVE	95020	2
CAD980884720	RCRIS	GENTRY FOODS CORP	255 FITZGERALD AVE	95020	
CAD981690407	RCRIS	SANDOZ AGRO INC	5653 MONTEREY RD	95020	4
CAD981410921	RCRIS	EXXON SERVICE STATION NO 7-31	700 1ST/MILLER	95020	
CAD982500787	RCRIS	SCREENPLAY SILK SCREENING	8380 CHURCH ST STE G	95020	4
CAD981402571	RCRIS	SHELL STATION #204-2988-0105	8385 N. MONTEREY/WILBURN	95020	
CAD983599457	RCRIS	KELLIS CLEARNERS	8400 A CHURCH ST	95020	
CAD981402514	RCRIS	SHELL STATION #204-2988-0402	850 PACHECO PASS HWY # 10	95020	4
CAD066522129	RCRIS	HOPE REHABILITATION SERVICES	8855 MURRAY AVE	95020	4
CAT080024656	RCRIS	PACIFIC BELL	L7S BUENA VISTA	95020	
CAT080021140	RCRIS	PACIFIC BELL	L8S THOMAS ROAD @ HIGHWAY 101	95020	
CAT080019334	RCRIS	PACIFIC BELL	L9S GREENFIELD FARMS @ HWY 101	95020	
CARIVE1RISAN	RST	RIVER OAKS PUMP STATION	1 RIVER OAKS PY	SAN J	
CAGOUI10PGIL	RST	GOUILON GAS	10 PONON AVE	95020	
CAS.G.101GIL	RST	S.G. BORELLO & SON'S INC	101 HWY & CASTOR VLY RD	95020	
CAGEOR1086GIL	RST	GEORGE NISHIMATSU	10860 006TH AVE	95020	
CAPETE1105GIL	RST	PETER O GLUHAICH FARMS	1105 NEW BOLSA RD	95020	
CAGILR1115GIL	RST	GILROY	1115 N NAME UNO ST	95020	
CALEO1147SAN	RST	LEO H. KNABKE	11470 TURLOCK AVE	95046	4
CAWELL121SAN	RST	WELLS FARGO BUILDING #9460	121 PK CTR PLZ HIRIS	SAN J	
CASAN1300SAN-2	RST	SAN MARTIN WINERY	13000 DEPOT ST	SAN M	
CALICO1424SAN	RST	LICO DISTRIBUTING CO. INC.	14245 MONTEREY HWY	95046	4
CAEDWA1470SAN	RST	EDWARD J. LAZZARINI	14700 WATERS ST	95046	
CAJOE1515GIL	RST	JOE F. YOUNG FARMS	1515 W HILLVIEW CT	95020	4
CANORT1661SAN	RST	NORTECH PUMP STATION	1661 NORTECH PY	SAN J	
CAYELL1700SAN	RST	YELLOW FREIGHT SYSTEM	1700 MONTAGUE EX	SAN J	
CAREPU20CGIL	RST	REPUBLIC POWDERED METALS, INC	20 CASEY LN	95020	4
CAGILR25BGIL	RST	GILROY TRANSIT MIX INC	25 BUENA VISTA AVE	95020	2
CAESCO2695GIL	RST	ESCOBAR RANCH	2695 FERGUSON RD	95020	4
CAKORF3250GIL	RST	KORFF FARM	3250 ROOP RD	95020	4
CAERNE3385GIL	RST	ERNEST G. JONASSON	3385 DRYDEN AVE	95020	4
CATRAN450GIL	RST	TRANS VALLEY TRANSPORT INC.	450 E 9TH ST	95020	2
CAJOE5365GIL	RST	JOE FELICE FARM	5365 MONTEREY RD	95020	4
CA96295887GIL	RST	96293	5887 MONTEREY RD # 96293	95020	4
CAFRAN670GIL	RST	FRANK VIGNA	670 DENIO AVE	95020	4
CASJ675SAN	RST	S J HOSP & HEALTH CTR	675 E SANTA CLARA ST A&B	SAN J	
CAFARO80CGIL	RST	FAROTTE CONSTRUCTION CO.,INC.	80 CASEY LN	95020	4
CAVIEI850GIL	RST	VIEIRA SERVICES CO., INC	850 PACHECO PASS HWY	95020	4
CACOYOGILRGIL	RST	COYOTE FFS	GILROY HOTSPRINGS/CA RD	95020	
CAHIGHHIGHGIL	RST	HIGHWAY 152 FUEL DEPOT	HIGHWAY 101 & 152	95020	
CACATTJAMIGIL	RST	CATTLE RANCH	JAMIESON RD	95020	4
CAOAKMRENASAN	RST	OAKMEAD PUMP STATION	RENAISSANCE DR	SAN J	
CAJACKROOPGIL	RST	JACK BOYTO	ROOP RD	95020	
CA43-AN-0015	STLNDFIL	GUADALUPE SANITARY LANDFILL	15999 GUADALUPE MINES RD	SAN J	
CA43-AN-0008	STLNDFIL	KIRBY CANYON RECYCL & DISP FA	910 SCHELLER AVE	SAN J	
CA43-AN-0010	STLNDFIL	MARTIN PARK LANDFILL	FORESTDALE AVE	SAN J	
CA43-AN-0001	STLNDFIL	OWENS FIBERGLASS CO	LOS ESTEROS RD	SAN J	
CA43-AN-0007	STLNDFIL	ZANKER RD (NINE PAR) SANITARY	LOS ESTEROS RD && ZANKER RD	SAN J	
CA43-AN-0004	STLNDFIL	MARSHLAND SOLID WASTE FACILIT	NW HWY 237 & GOLD ST ALVISO	SAN J	
CA43-AN-0011	STLNDFIL	COYOTE-HELLYER PARK LANDFILL	PALISADE DR	SAN J	
CA43-AN-0012	STLNDFIL	STORY RD LANDFILL	REMILLARD COURT	SAN J	
CA43-AN-0009	STLNDFIL	ROBERTS AVE LANDFILL	ROBERTS AVE	SAN J	

06/28/95

SUMMARY OF FINDINGS

for

PROJECT # L953248PO # L953248
UNKNOWN
SAN MARTIN, CA 95046

Zips Searched : 95020, 95046
Cities Searched : SAN MARTIN, SAN JOSE, LLAGAS-UVAS
Counties Searched : SANTA CLARA

DATABASE	RADIUS REQUESTED	RECEIVED DATE OF DATA BY AIC*	ACTUAL SEARCH METHOD	# SITES FOUND	APPROX. DIST. FROM SITE, MILES 0-1/8	1/8-1/4	1/4-1/2	1/2-1	>1
CERCLIS	1/2	03/30/95	RADIUS	0	0	0	0	0	0
STSITE	1	04/18/94	RADIUS	0	0	0	0	0	0
NPL	1	01/30/95	RADIUS	0	0	0	0	0	0
TSD	1	03/16/95	RADIUS	0	0	0	0	0	0
RCRIS	1/4	03/16/95	RADIUS	0	0	0	0	0	0
RCEVAL	1/4	03/16/95	RADIUS	0					
RCVIOL	1/4	03/16/95	RADIUS	0					
RST	1/4	06/15/94	RADIUS	0	0	0	0	0	0
LRST	1/2	03/14/95	RADIUS	0	0	0	0	0	0
ERNS	1/4	09/23/94	RADIUS	0	0	0	0	0	0
LANDFILLS	1/2	12/12/94	RADIUS	0	0	0	0	0	0

* AIC believes that it performs all appropriate inquiries to obtain the most current information from each of the applicable databases consistent with or exceeding good customary or commercial practice. *

0043502

List of Streets within the Area of Review

This list includes all street names available from the U.S. Census Bureau's TIGER digital map file series. It is another reference to aid in determining if a site exists within the area of review. This list should not be used as the sole source to locate a site since there are cases where a street is named incorrectly or is labeled 'unknown'.

Street Name	Street Name
Coolidge Ave	
Cox Ave	
Harding Ave	
Highland Ave	
Llagas Creek	
Turlock Ave	
UNNAMED NONVISIBLE FEATURE	

APPENDIX B

ENVIRONMENTAL RISK INFORMATION AND IMAGING SERVICES REPORT

APPENDIX L

Electromagnetic Fields (EMFs) Report

Prepared by

PG&E

July 1995

Pacific Gas and Electric Company

Rich Cashdollar, Director GM&C
123 Mission St., Room 2514
San Francisco, CA 94119
(415) 973-7041
Fax: (415) 973-7161

June 30, 1995

RECEIVED
JUL 10 1995
NOLTE and ASSOCIATES
SAN JOSE

PG&E

Bert Virrips
Nolte and Associates, Inc.
60 South Market St., Suite 300
San Jose, CA 95113

Dear Bert:

Enclosed is the report you requested addressing power line frequency electric and magnetic fields (EMF) and the results of magnetic field recordings near transmission power lines that traverse the Hayes Ranch site in Morgan Hill.

Also enclosed is our standard EMF information package that we send to our customers who have interest in the subject.

Please call me at (510) 874-2474 if I can be of further assistance.

Sincerely,

Dave Gregory

Enclosure

PURPOSE

This report discusses"power line frequency" electric and magnetic fields (EMF)--specifically, what these fields are and the potential link to human health. It also shows the results of measurements taken of magnetic field strength from transmission power lines that cross part of the Hayes Valley Development Project located in Morgan Hill, CA.

BACKGROUND & SETTING

A letter dated June 22, 1995 (copy attached) authorized and requested PG&E to conduct EMF measurements at the Hayes Ranch site.

PG&E owns and operates nearby electric transmission and distribution power lines. Transmission lines are those rated at greater than 50,000 volts (50 kV); distribution lines are those rated at less than 50 kV.

Two vertically mounted transmission line circuits--three wires per circuit and two circuits per tower--were specifically requested to be measured. Figures 1, 2 and 3 show the area and lines in question. Each circuit is rated and presently operated at 115,000 volts (115 kV). The westernmost line runs from Metcalf substation to Salinas, while the easternmost line runs from Morgan Hill to Llagas substation.

ELECTRIC AND MAGNETIC FIELDS (EMF)

Electric and magnetic fields (EMF) are invisible fields of force created by electric voltage (electric fields) and by electric current (magnetic fields). EMF exist wherever there is electricity -- in appliances, homes, schools and offices, and in power lines (including those buried underground).

Electromagnetic fields occur along a spectrum of frequencies (or wavelengths). The amount of energy in such fields is proportional to frequency, i.e., the higher the frequency, the higher the energy. EMF from power lines and most appliances have much lower frequency, and therefore energy, than microwaves or X-rays, for example. Microwave energy passes through and is absorbed by most materials, and is often sufficient to make them hot. X-ray energy actually breaks apart the molecules that contain genes, which is why excessive X-ray exposure can lead to mutations and cancer. EMF from power lines do not have enough energy to either effectively heat or break apart molecules.

The strength of magnetic fields associated with power lines depends on the amount of current (not voltage), heights and spacing of the conductors or lines above the ground, electrical phasing configurations and balance, actual distance from the lines, and the presence of any other nearby sources of electricity or current.

Magnetic fields pass through most common objects, including the earth, without being significantly affected. Electric fields are affected by objects, especially those that conduct electricity. Normal houses can partially shield electric fields, but not magnetic fields.

POTENTIAL HEALTH EFFECTS

There is no scientific consensus on the actual health effects of exposure to EMF, but it is an issue of public concern.

There are no health-based standards for human exposure to EMF in the United States. Agencies at the federal and state levels, including the U.S. Environmental Protection Agency, have been reviewing the studies conducted thus far to determine if adverse health effects are associated with EMF, and have found no basis for setting health standards. To date, two states -- Florida and New York -- have set magnetic field standards for the edge of transmission rights-of-way. These standards are based on maintaining the "status quo" that presently exists near electric power facilities, until there is definitive information on whether EMF exposure is safe or unsafe.

In California, the Public Utilities Commission (CPUC) has conducted its own investigation into EMF issues. It created an EMF Consensus Group, comprised of 17 representatives from concerned citizens, utilities (including PG&E), trade unions, and health officials to develop recommendations of interim policies that the CPUC and the utilities could pursue relevant to power line frequency EMF (as opposed to radio-cellular frequency EMF). In March, 1992, the Consensus Group submitted its recommendations addressing the areas of overall policy, education and research. In November, 1993 the CPUC issued its decision, which included specific recommendations for policy, and authorization for funding of further research and education. It also concluded that "it is not appropriate to adopt any specific numerical standard in association with EMFs until we have a firm scientific basis for adopting any particular value."

The California Department of Health Services (DHS) has been actively involved in developing and implementing the state's response to the EMF issue. In coordination with national research efforts, the DHS has been participating in or conducting epidemiological and exposure assessment studies. The DHS also has prepared public information material on the EMF issue and has coordinated training sessions for local county health officers and individuals offering EMF measurements.

In September, 1992, Swedish scientists announced the results of an epidemiological study looking at the association between cancer and living in residences adjacent to high voltage (transmission) power lines. Based on its finding of seven or fewer cases of childhood leukemia (out of 436,500 total population) in the highest exposure group, the study concludes that there is an increased risk for leukemia in children who lived near high voltage lines. No associations were found between all cancers in children or cancer in adults and EMF exposures. Past exposure to EMF was calculated using a computer model of the likely loads on power lines; however, from the data taken when spot measurements were actually made in the homes of study participants, no associations were found. This study is currently undergoing review by other researchers, and should be finalized later in 1993.

In contrast to the Swedish study above, the results of the Finnish EMF/childhood cancer study appeared in the October 9, 1993 British Medical Journal with the comparable Danish study as a companion article. The study looked at 134,800 children, who at any time in 1970 through 1989 had lived within 500 meters of a transmission line in a house that had a calculated annual average 50 Hertz magnetic field contribution from the line of 0.1 mG or greater at least once during that period. The authors reached a rather strong conclusion: "Residential magnetic fields of transmission power lines do not constitute a major public health problem regarding childhood cancer. The small numbers do not allow further conclusions about the risk of cancer in stronger magnetic fields."

More research on the EMF issue is under way by both private and public research organizations at the national and international levels. Like the Swedish and Finnish studies mentioned above, some of this research will be epidemiological. Other research will be conducted in the laboratory and in the area of exposure assessment. With magnetic fields, there is still a basic lack of essential information logically linking health effects with exposure dose.

Scientific reviews which have looked at many research projects have concluded that data from epidemiology, whole animal studies and cellular experiments are not sufficient to conclude that the weight of evidence shows an adverse health effect from exposure to power line frequency electric and magnetic fields. Further, none of the review agencies has gone on record in favor of setting standards for exposure. Reviews completed in 1992 or prior include:

- New South Wales Government, Sir Harry Gibbs, February 1991, Inquiry into Community Needs and High Voltage Transmission Line Development.
- The Electromagnetic Health Effects Committee, Public Utilities Commission of Texas, March 1992.
- The Environmental Protection Agency, Science Advisory Board, April 1992.
- The Connecticut Academy of Science and Engineering, April 1992.
- The Health Council of the Netherlands, April 1992.
- The Illinois Department of Public Health and the Illinois Environmental Protection, 1992.
- The National Radiological Protection Board of United Kingdom, 1992.
- The Universities Consortium on Electromagnetic Fields Investigation in Power Line Frequency EMF and Its Risks to Health, Colorado, March 1992.
- The Oak Ridge Universities Consortium, Department of Labor, June 1992.

POTENTIAL HEALTH EFFECTS (cont'd)

In 1993 and 1994, similar reviews or updates produced the same conclusion:

- National Radiological Protection Board (United Kingdom), March 1993, Electromagnetic Fields and the Risk of Cancer.
- National Institute of Health & Medical Research, INSERM, (France), Synthesis of the Literature on Health Effects from Very Low Frequency EMF.
- Virginia Department of Health, Monitoring of Ongoing Research on the Health Effects of High Voltage Transmission Lines, 8th Annual Report, April 1993.
- Connecticut 1993 Report on Task Force Activities to Evaluate Health Effects from Electric and Magnetic Fields, March 1993, Interagency Task Force Studying EMF (Department of Environmental Protection, Department of Health Services).
- Maryland Dept. of Natural Resources and the Public Service Commission of Maryland, February 1994.
- Advisory Group on Non-Ionizing Radiation of the National Radiological Protection Board, Electromagnetic Fields and the Risk of Cancer, April 1994.

MEASUREMENT RESULTS

On Wednesday, June 28, 1995, from 11:05 a.m. to 11:35 a.m., PG&E recorded power line frequency magnetic field strengths.

Two EMDEX II meters were used. The EMDEX II is a portable, hand-held, three-axes meter that records power line frequency (60 Hertz and associated harmonics) magnetic field intensities versus time or distance. It displays "spot" reads, and collects and stores reads every 1.5 seconds for graphical download.

At the time of these measurements, the Morgan Hill-Llagas circuit was carrying about 200 amps; the Metcalf-Salinas circuit was carrying almost 175 amps. Please note that during the the year there can be significant change in these circuit loads (both magnitude and direction) due to generation feeds from Gilroy Foods.

Figure 4 is a "profile" (i.e., a recording of field strength vs. distance moving away from the circuits at a right angle) taken from west to east. The two dashed lines show field strength directly under each circuit at the dirt road extension of Highland Avenue. The field strength was recorded to be about 2.5 milliGauss (mG). Approximately 60 feet away from the tower centerline, the field strength had dropped to about 2.0 mG. At about 130 feet away from the tower centerline, the field strength had dropped to about 1.0 mG.

Figure 5 is a similar profile but taken from east to west. Results echoed those shown in Figure 4.

Figure 6 is a recording of magnetic field strength vs. time of day. This was taken with the second EMDEX II meter to not only show date and time of reads, but to help validate the reads of the first meter.

These results are valid only for the date and time of day that they have been taken. Measured field strength, or intensity, is only one of several aspects of magnetic fields that science cannot yet say are either biologically important or relevant. Such aspects --any or all of which might play a role in how magnetic fields affect health, if they do --also include:

- time (chronic, long term exposure to low, background levels versus momentary exposure spikes around high field sources;
- frequency and harmonics (the relative harmonic-free 60 Hertz fields typical of transmission lines versus the sometimes high harmonic content of fields associated with distribution lines and customer loads);
- orientation of an alternating magnetic field in relation to the earth's static dc geomagnetic field, which ranges between 250 mG and 600 mG, depending on distance from the poles.

MEASUREMENT RESULTS (cont'd)

Measurements are representative of the conditions on the day and time they were taken. Presently, we do not have a scientific basis for telling the public what risks, if any, are associated with this type of exposure. No long term exposure health-based national, international or state EMF standards or regulations have been developed.

HAYES VALLEY DEVELOPMENT PARTNERS
405 EL CAMINO REAL #127
MENLO PARK, CA 94025

June 22, 1995

Mr. Dave Gregory via Facsimile #510-874-2669
PG&E
1919 Webster Street, 4th Floor
Oakland, CA 94612

Re: EMF Measurements at Hayes Ranch

Dear Mr. Gregory:

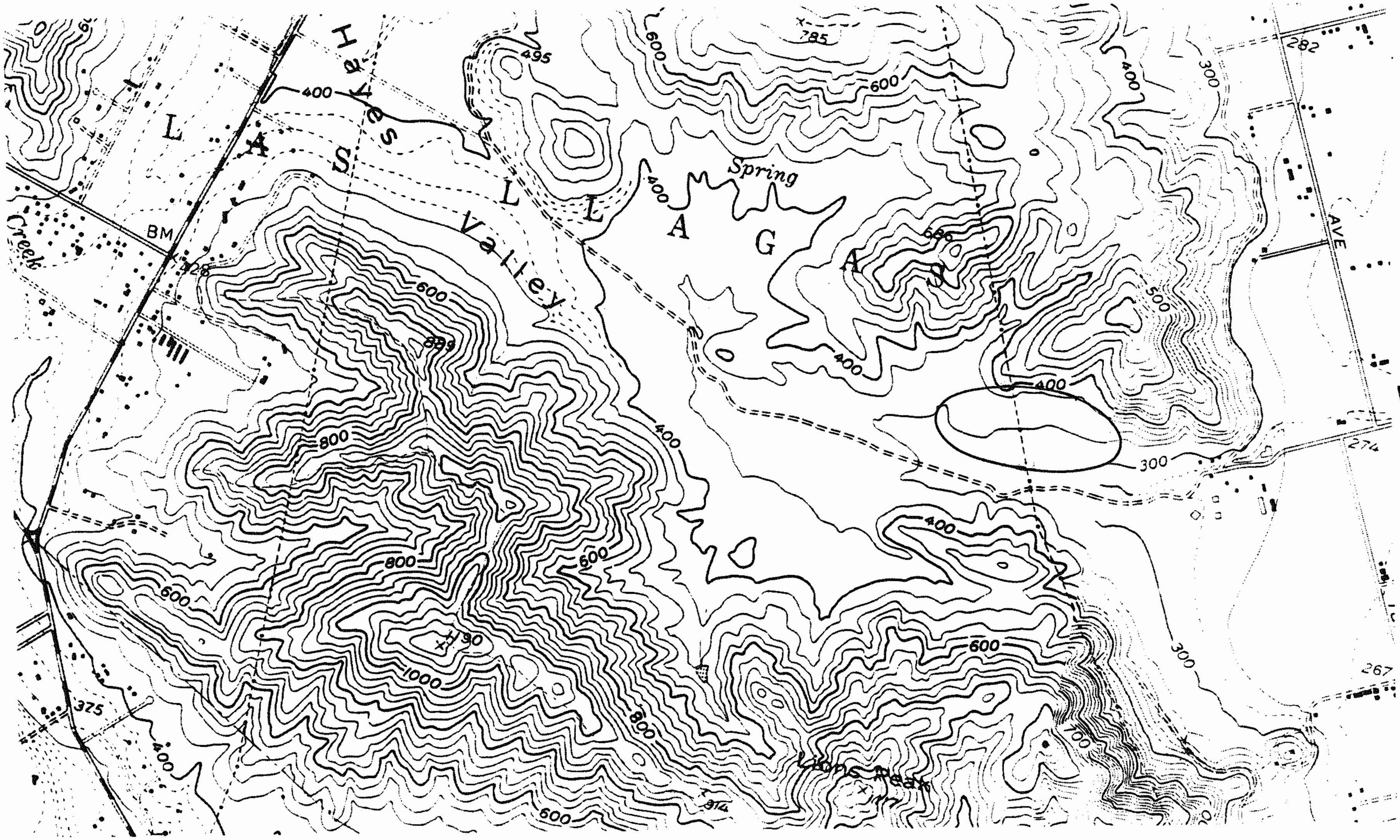
You have my authorization to conduct electromagnetic field measurements at Hayes Ranch, as you discussed with Bert Verrips of Nolte and Associates on June 21, 1995.

A package with site information has been mailed to you separately.

Thank You,

Tom Hix,
Hayes Valley Development Partners

n:\sjo20289\14\wp51\cl1702-d



Scale: 1" = 1000' ±

FIGURE 1

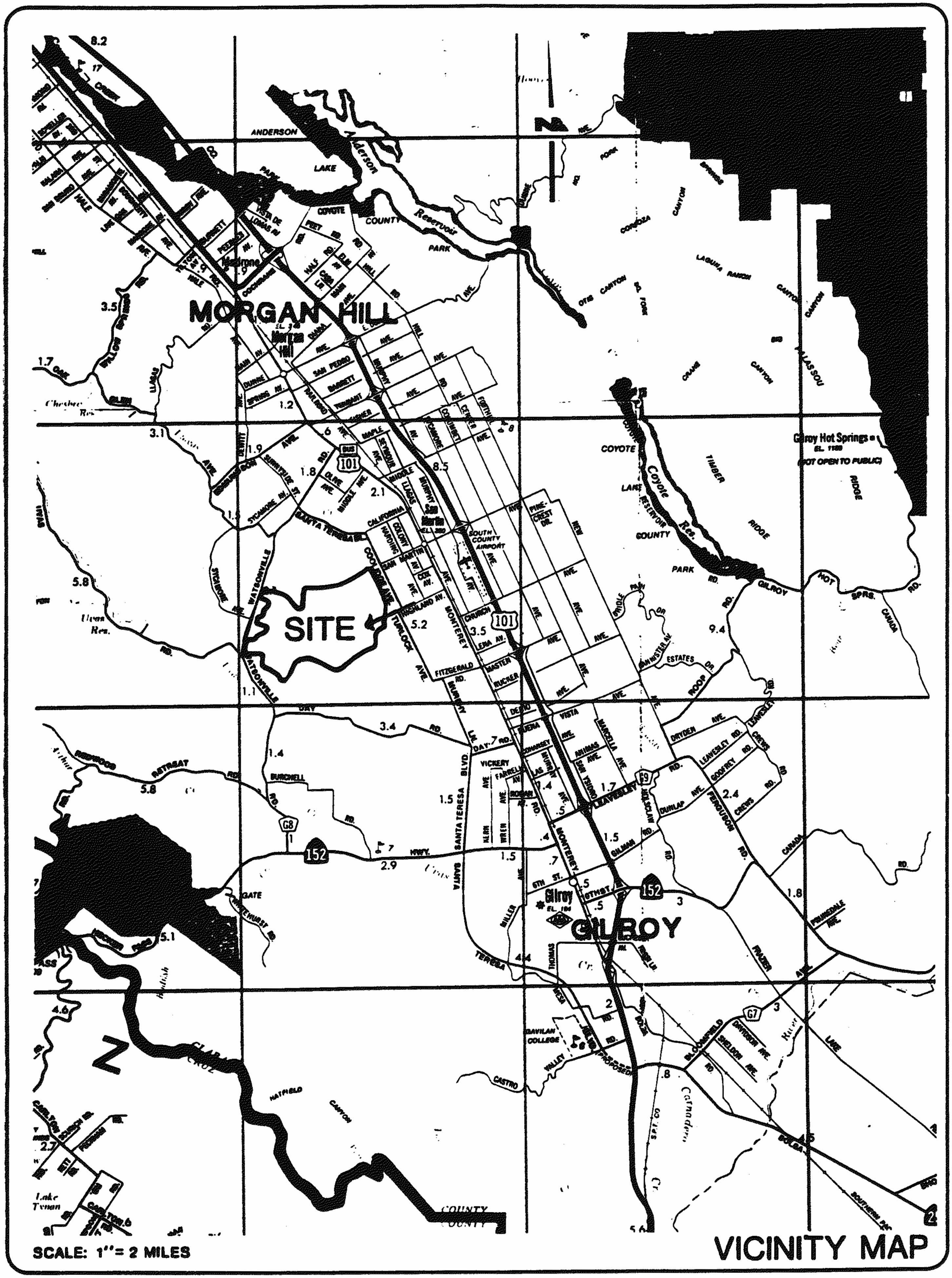
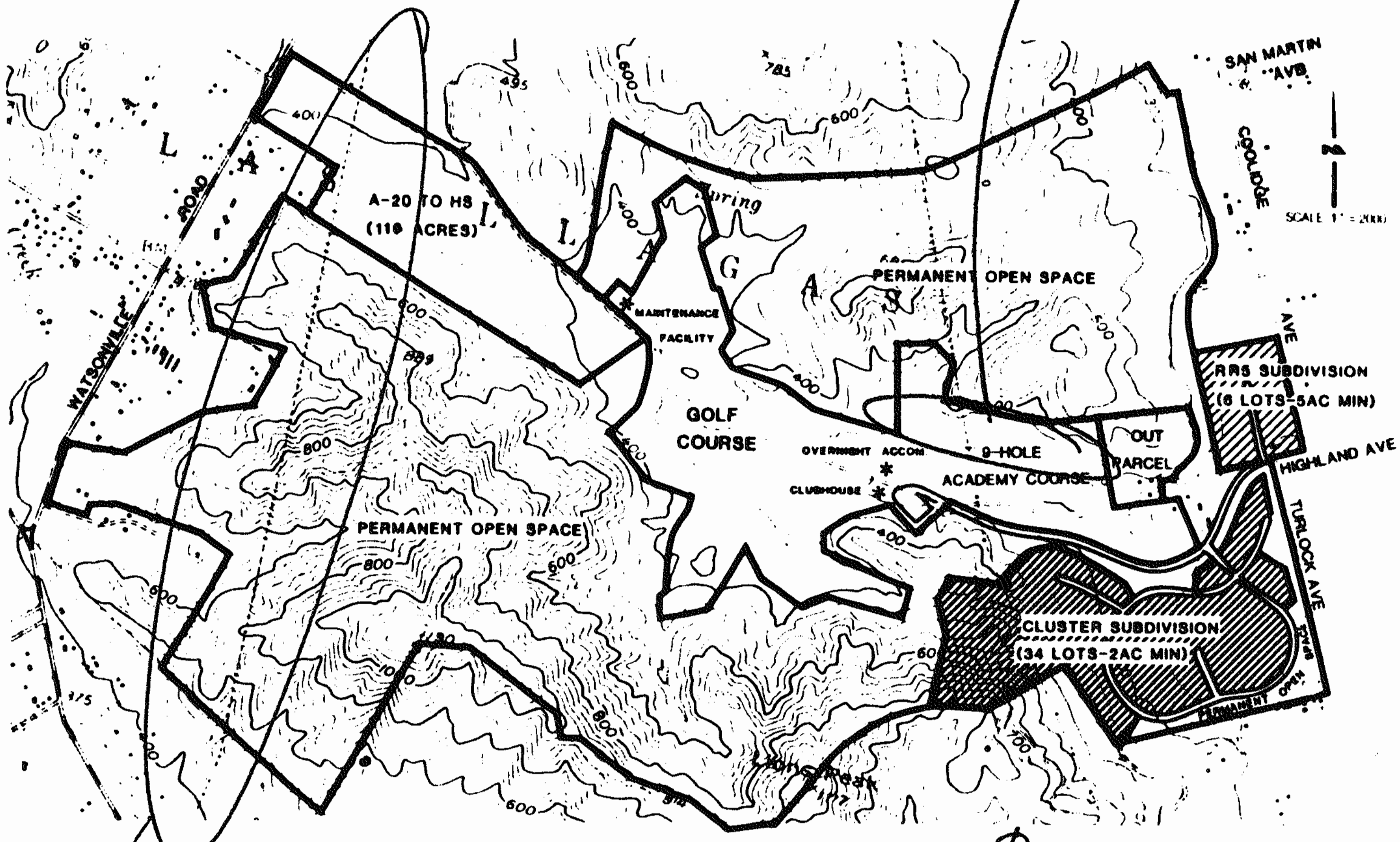

MORGAN HILL
SITE
GILROY
ANDERSON
LAKE
COUNTY
Reservoir
PARK
COYOTE
LAKE
COUNTY
PARK
Coyote Res.
Gilroy Hot Springs
(NOT OPEN TO PUBLIC)
TIMBER
RIDGE
SOUTH COUNTY AIRPORT
SANTA TERESA BLVD.
MONTEREY
WATSONVILLE
HWY.
101
152
G8
G7
GAVILAN COLLEGE
SCALE: 1"= 2 MILES
VICINITY MAP

FIGURE 2

Residential lots (2ac min) now proposed in this area.



115 KV line

- no development proposed here (no measurements needed)

HAYES VALLEY DEVELOPMENT PLAN

FIGURE 3

File:HAYESRCH.MDX Data:Broad Resultant Label:Profile 1

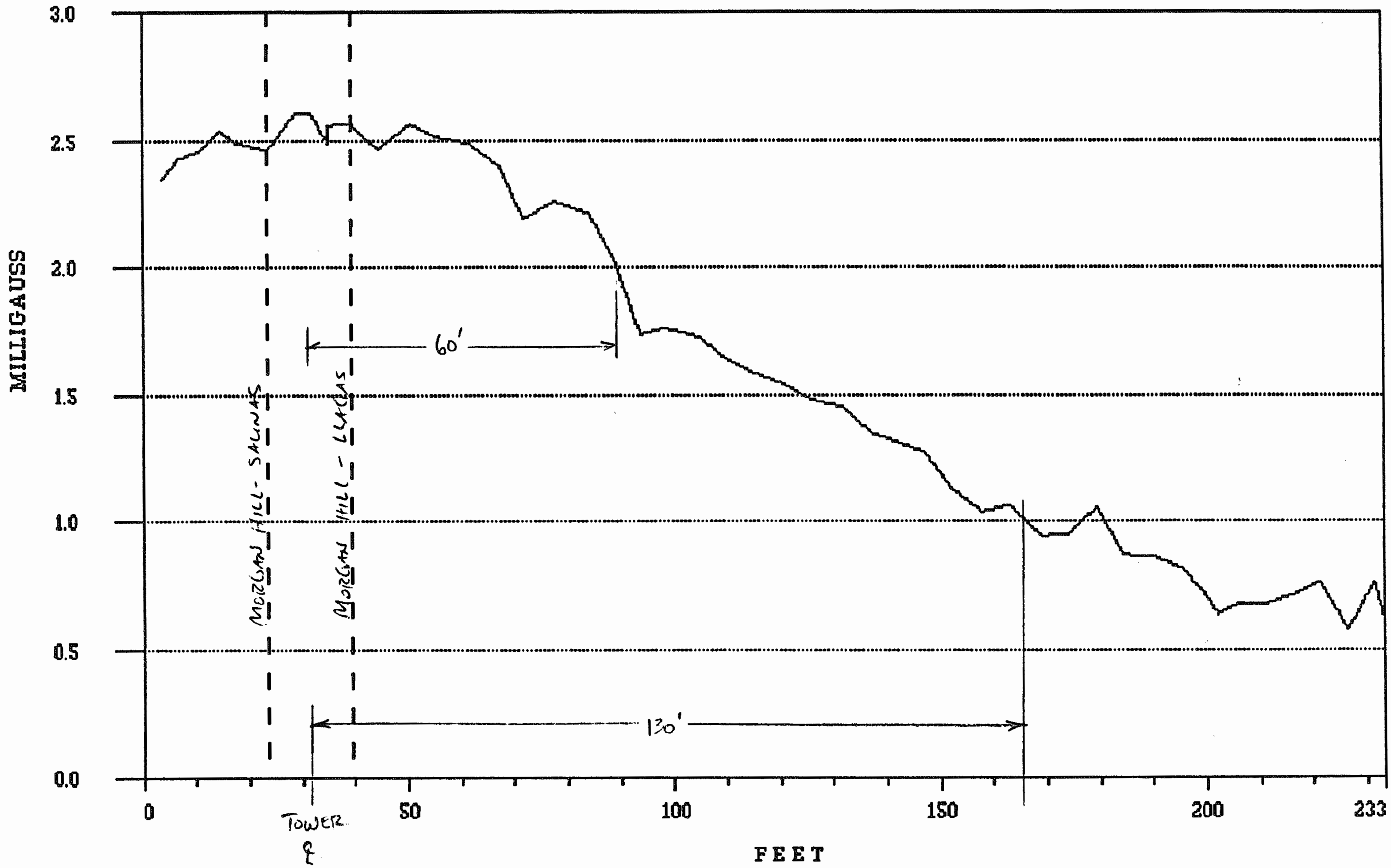


FIGURE 4

File:HAYESRCH.MDX Data:Broad Resultant Label:Profile 2

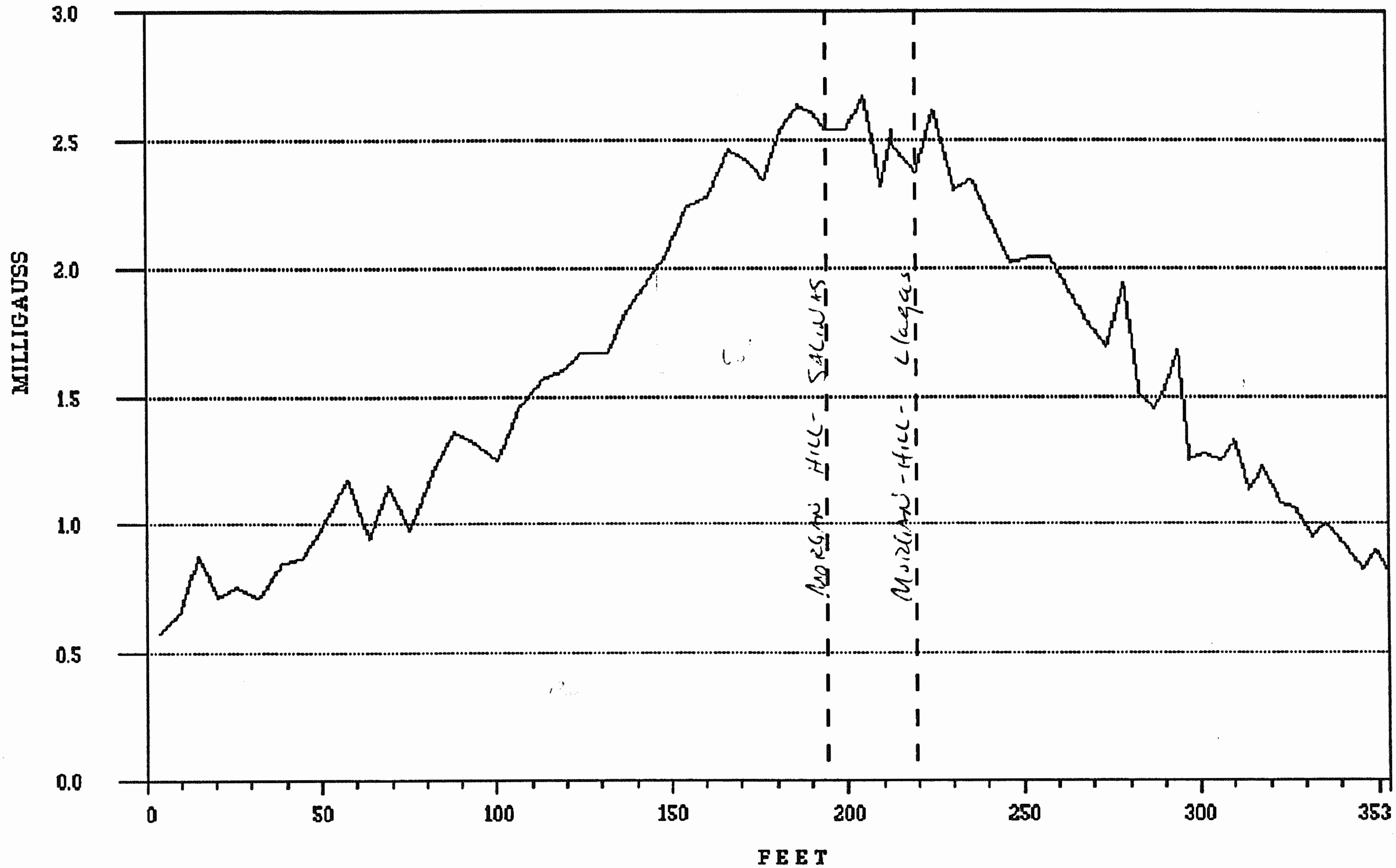


FIGURE 5

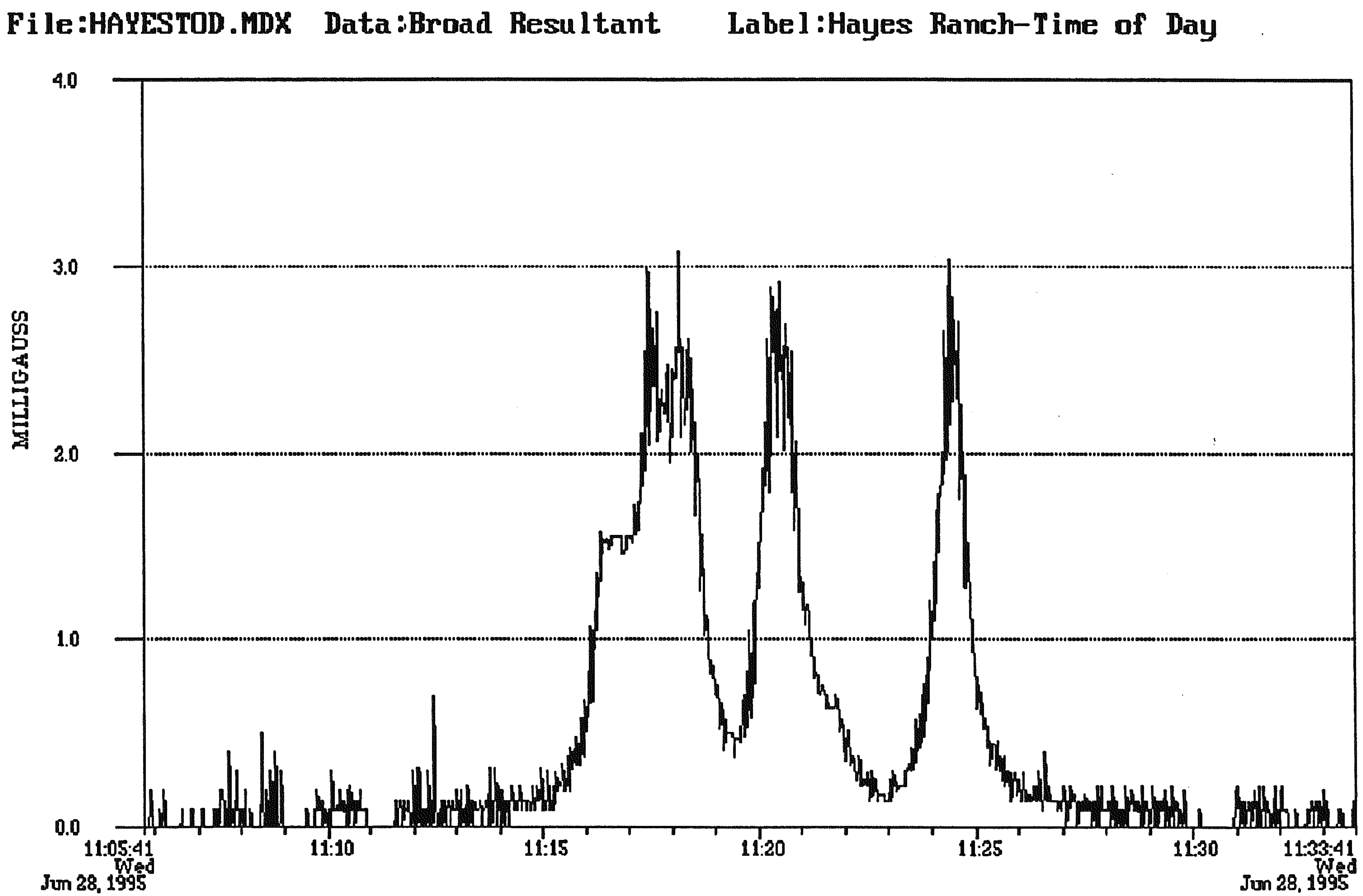

File:HAYESTOD.MDX Data:Broad Resultant Label:Hayes Ranch-Time of Day
MILLIGAUSS
4.0
3.0
2.0
1.0
0.0
11:05:41
Wed
Jun 28, 1995
11:10
11:15
11:20
11:25
11:30
11:33:41
Wed
Jun 28, 1995

FIGURE 6

APPENDIX M

Water Supply Reports and Documentation

GEOCONSULTANTS, INC.
Engineering Geology • Hydrogeology
Ground-Water Exploration & Development
Ground-Water Resource Management
1450 Koll Circle, Suite 114
San Jose, California 95112
Telephone: (408) 453-2541
Fax: (408) 453-2543

Project G1022-01
April 6, 1995

Mr. Tom Hix
Hayes Valley Development Partners
405 El Camino Real, Suite 127
Menlo Park, CA 94025

**RE: PRELIMINARY GROUND-WATER AVAILABILITY
PROPOSED LION'S GATE DEVELOPMENT
HAYES VALLEY
SANTA CLARA COUNTY, CALIFORNIA**

Dear Mr. Hix:

In accordance with your authorization of February 5, 1995, we have completed our preliminary ground-water availability study for the proposed Lion's Gate development. The purpose of the study was to evaluate, on a very preliminary basis, the hydrogeologic conditions in the area, with particular respect to the maximum amount of ground water that could be extracted, without causing an overdraft condition.

INTRODUCTION

The scope of work for this study involved a review of the existing published and unpublished hydrogeologic data. Water well location studies and aquifer testing were outside the scope of this preliminary study.

The location of the study area with respect to regional hydrogeologic conditions is shown on the Regional Map, Figure 1. The proposed development encompasses roughly 450 acres of the approximately 1,700-acre property, located southwest of San Martin in Santa Clara County, California. At the present time, the property consists primarily of grazing land, with ranch buildings clustered in the eastern portion near Highland Avenue. One existing ground-water well is purportedly located near the buildings, however, no information is available.

Present development plans call for the construction of one 18-hole and one 9-hole golf course, a driving range, a clubhouse, and a motel on roughly

290 acres of the valley floor. 40 residences are planned for 176 acres of the eastern portion of the site, with the remainder of the property in open space. At present, it is proposed to supply the development entirely from off-site water sources. Ground water will be used only as a supplemental source for golf course irrigation.

HYDROGEOLOGIC CONDITIONS

According to Dibblee (1973a and 1973b), the geologic units within the immediate site vicinity include alluvial materials, present along the valley floor, and bedrock materials belonging to the Franciscan Assemblage. The alluvial materials, consisting primarily of unconsolidated to semi-consolidated gravels, sands, and silts, are considered the primary aquifer in the area. These materials are less than 100 feet in thickness at the site, according to available exploratory boring logs. For the most part the permeability of these soils is moderate at 0.2 to 0.63 inches per hour (U.S. Department of Agriculture, 1968).

Franciscan Greenstone and Sandstone underlie the alluvium and comprise the hills both to the north and south of the valley floor. Ground-water wells can be located within these materials, particularly where intense fracturing has occurred, however, yields generally do not exceed 25 gpm.

The West Branch of Llagas Creek emanates from a spring in the northern portion of the property, and eventually flows through the alluvial deposits to the east. The hills to the north and south provide rainfall recharge to the alluvial ground-water basin. For the purposes of this preliminary study, roughly 100 acres in the western portion of the property was not included, since it is outside this basin. Within the alluvial valley, ground-water levels are relatively shallow, with depths generally less than 50 feet. Ground-water gradients are gentle and parallel the direction of creek flow. Ground-water recharge at the site occurs primarily from rainfall.

GROUND-WATER AVAILABILITY

Although ground water is stored in the water-bearing alluvial deposits and fractures within bedrock materials, the ultimate availability is determined by the amount of rainfall recharge on a long term basis. Ground-water extraction in an amount over the natural or artificial replenishment of the subsurface reservoir will result in mining and overdraft. Because of limited data, a normal hydrologic balance would be misleading due to the many unknowns. Therefore, as one approach to assessing the available supply, we have evaluated rainfall and runoff data in order to estimate available recharge for the site. It is important to note that a significant amount of the golf course irrigation water will also enter the ground-water basin as recharge. However, to provide a conservative estimate, this figure was not included in our analysis.

The project site encompasses roughly 1,700 acres. Rantz (1971) indicates that the average annual rainfall is 21 inches. Rantz (1974) further estimates that 4.5 inches of rainfall becomes runoff, with the remaining quantity either percolating into the ground, or being lost to evapotranspiration (ET). The non-runoff component of rainfall at the site is 16.5 inches. We estimate that roughly 80 percent of this total is lost to ET and near-surface retained moisture, with the remaining 20 percent becoming deep percolation. Therefore, about 3.3 inches of rainfall or roughly 470 ac-ft/yr will be available for recharge to the site on an average annual basis.

The surface acreage of the valley floor was measured to be roughly 330 acres, while the average saturated thickness of the alluvial materials was estimated to be approximately 50 feet. If an average specific yield of 13 percent is applied to the saturated materials, then the storage capacity of the alluvial basin is estimated to be roughly 2,150 ac-ft (area X saturated thickness X specific yield). This figure indicates a rough approximation of the absolute limit of ground water available if no recharge were to occur.

A prudent preliminary estimate of ground-water availability for the Lion's Gate development would be either one-third of the total storage capacity (717 ac-ft) or two-thirds of the annual recharge (313 ac-ft), whichever is less. Therefore, we recommend that the safe yield of the project be limited to 313 ac-ft/yr or an average of 280,000 gallons per day. Actual pumping rates may actually exceed the daily average depending on the time of year, provided that the annual safe yield is not exceeded. In addition, extended periods of heavy rainfall or drought may significantly alter the annualized averages.

LIMITATIONS

Geoconsultants, Inc. has provided its findings, recommendations, specifications, and professional advice after preparing such information in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing under similar conditions in the fields of hydrogeology. This acknowledgment is in lieu of all warranties either express or implied.

Geoconsultants, Inc. makes no guarantee of the granting of well approval, well use, and/or pumping permits by city, county, state, or other governmental authorities. No guarantee is made that water will be found in any specific quantity or mineral quality. Environmental changes, either naturally-occurring or artificially induced, may cause the quality and/or quantity of water produced to change with time. Therefore, we do not guarantee continued production or consistent mineral quality of ground water from any well in the future.

It has been a pleasure performing this preliminary evaluation for you. Should you desire a detailed basin water balance study to more accurately determine safe yield figures, or on-site studies for water well location, we will be happy to prepare a scope of work and cost estimate for that service. In the meantime, if you have any questions regarding this preliminary evaluation, please call.

Sincerely,

GEOCONSULTANTS, INC.

John K. Hofer
Engineering Geologist, EG-1065

JKH:rls
(G1022-01.doc)

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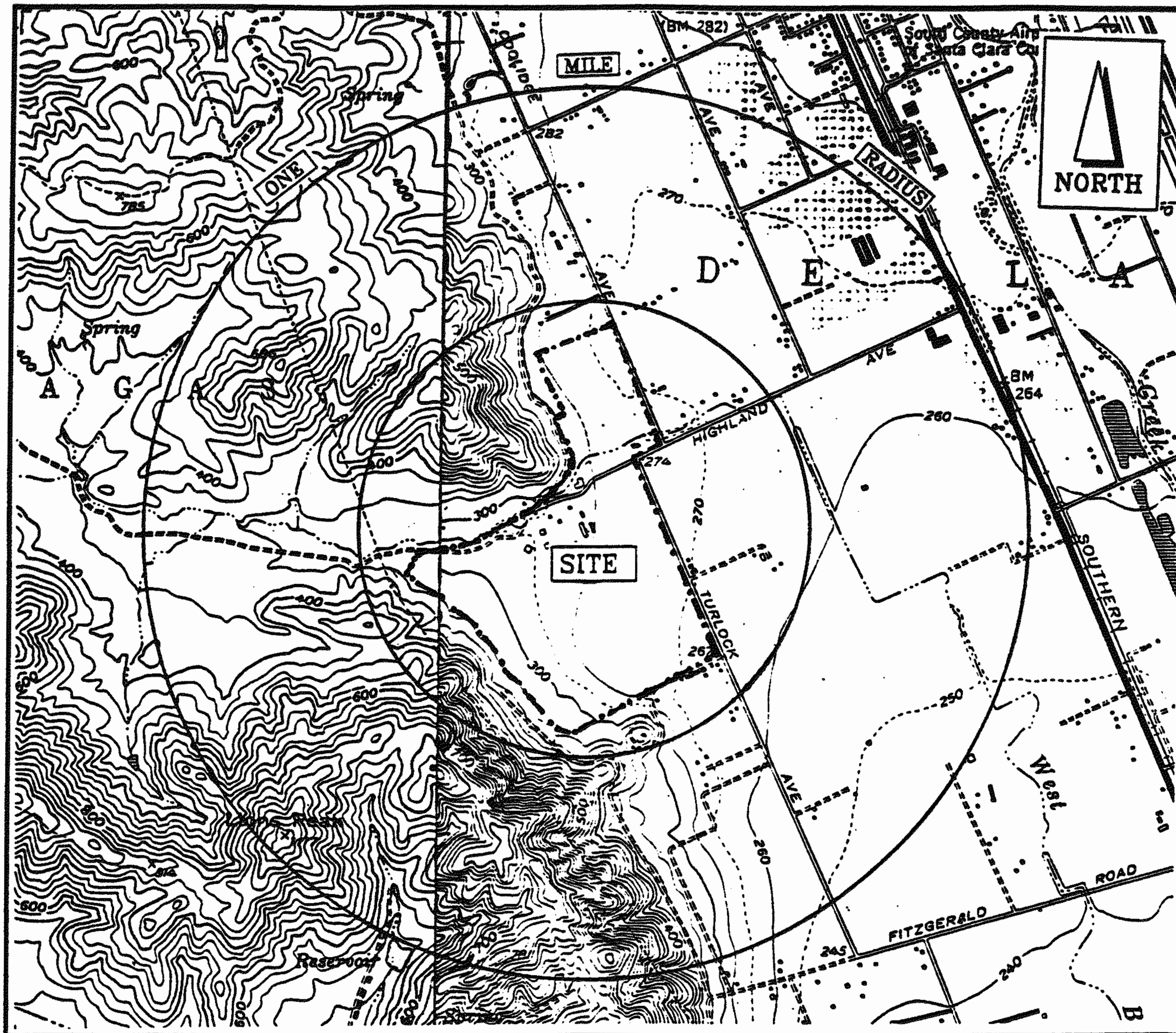
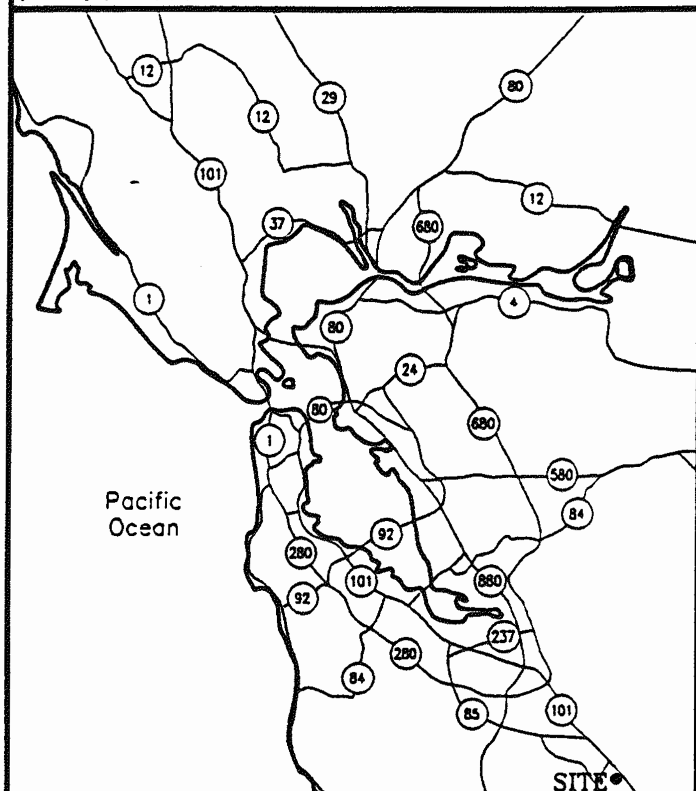




Notes:

1) All locations and dimensions are approximate.

2) Base map from USGS Gilroy Quadrangle (1955), photorevised 1981 and Mt. Madonna Quadrangle (1955), photorevised 1980.

Explaination:

Site Boundary

0 1/4 1/2 1

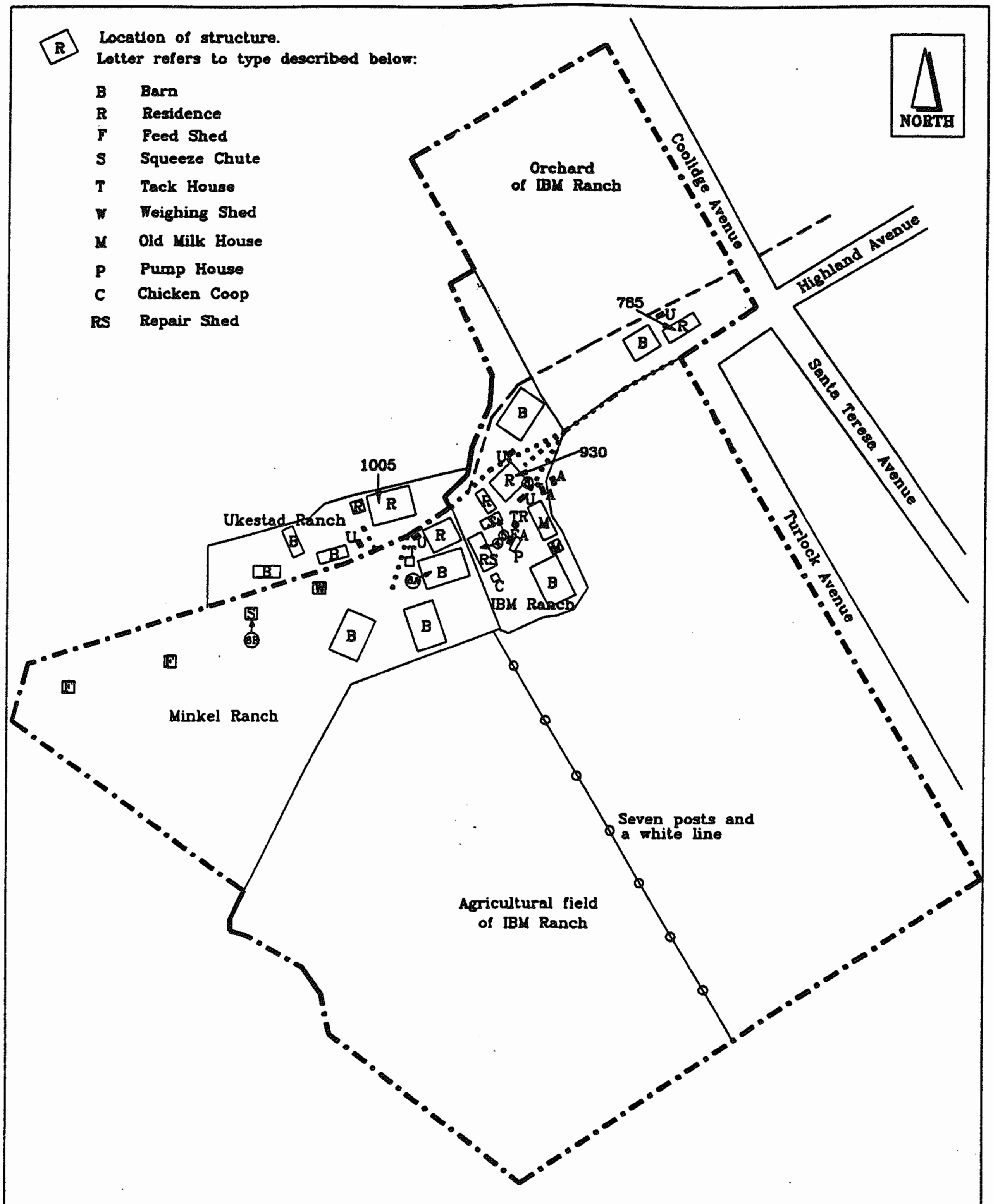
SCALE (MILES)

APPLIED GEOSCIENCES INC.

Environmental Consultants

SITE LOCATION MAP
HAYES VALLEY
SAN MARTIN, CALIFORNIA

PROJECT NO. L953284	FIGURE 1



Notes:

1) All locations and dimensions are approximate.

2) Base map adapted from Aerial Photograph, dated 10 August 1992.

0 40 600

SCALE, FEET

Explaination:

Site Boundary		A	Aboveground storage tank.
Creek		HA	Historic aboveground storage tank.
Access Road		U	Historic underground storage tank.
Photo locations		• TR	Pole-mounted Transformers
785	Address of resident		

APPLIED GEOSCIENCES INC.
Environmental Consultants

SITE PLOT PLAN
HAYES VALLEY
785, 930 AND 1005 HIGHLAND AVENUE
SAN MARTIN, CALIFORNIA

PROJECT NO. L953284 | FIGURE 2

FIGURE 3A. VIEW OF ONE 500–GALLON PORTABLE AST IN THE HAY FIELD, WHICH CONTAINS GASOLINE.

FIGURE 3B. VIEW OF TWO 500–GALLON PORTABLE ASTs, NEAR THE OLD MILK HOUSE, WHICH CONTAIN GASOLINE AND DIESEL.

PROJECT NO. L953284
FIGURE 3

APPLIED GEOSCIENCES INC.
Environmental Consultants

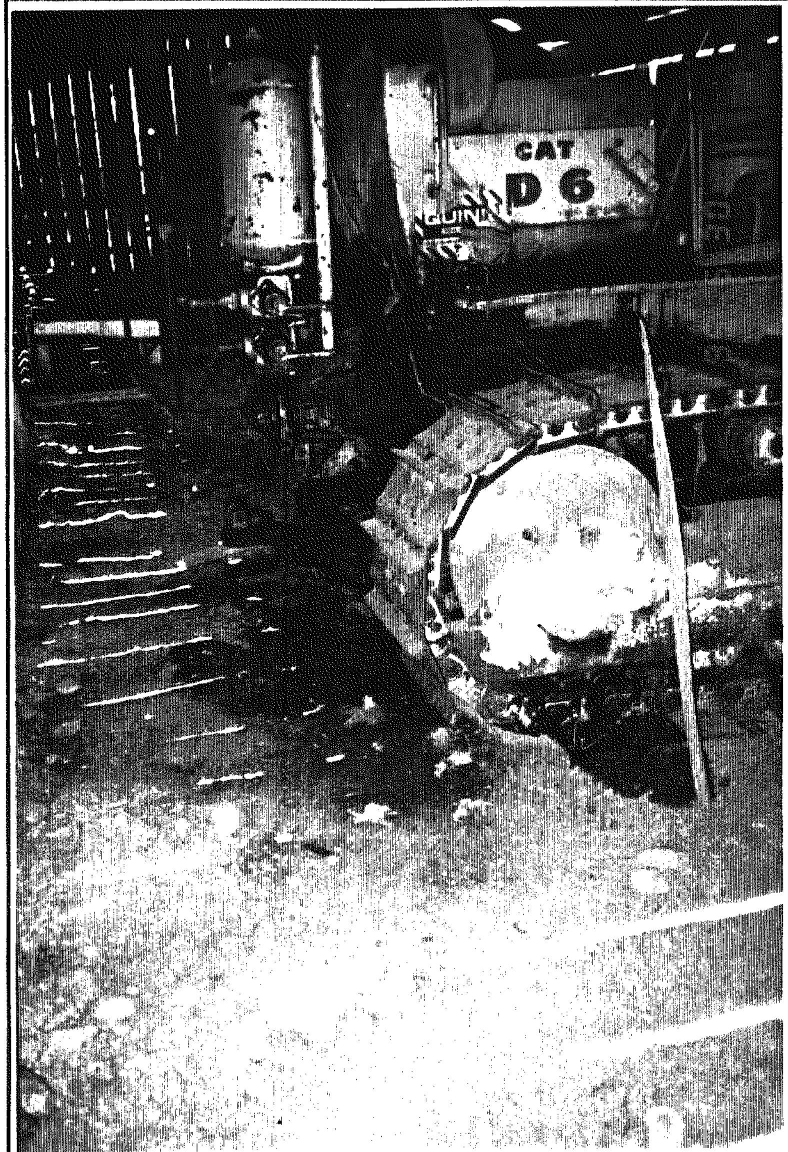


FIGURE 4B. VIEW OF DARK STAINS ON CONCRETE BENEATH A WOODEN FRAME IN THE REPAIR SHED.

FIGURE 4A. VIEW OF DARK STAINS ON CONCRETE BENEATH A TRACTOR IN THE REPAIR SHED.

PROJECT NO. L953284
FIGURE 4

APPLIED GEOSCIENCES INC.
Environmental Consultants

FIGURE 5A. VIEW OF TWO WOODEN SHEDS IN THE CENTRAL PORTION OF THE FARM/RANCH COMPLEX.

FIGURE 5B. VIEW OF AN OLD PUMP IN THE EASTERN MOST SHED.

PROJECT NO. L953284
FIGURE 5

APPLIED GEOSCIENCES INC.
Environmental Consultants

FIGURE 6A. VIEW OF FRESH AND USED OIL STORED IN A BARN LOCATED ON THE EAST SIDE OF THE SITE.

FIGURE 6B. VIEW OF A SQUEEZE CHUTE USED FOR PUTTING INSECTICIDES ON CATTLE, LOCATED ON THE EAST SIDE OF THE SITE.

PROJECT NO. L953284
FIGURE 6

APPLIED GEOSCIENCES INC.
Environmental Consultants

APPENDIX A

AGENCY INFORMATION CONSULTANTS RADIAL REPORT

Agency Information Consultants, Inc.

An ERIIS Company

AIC RADIAL REPORT

Job Number : 30-0043502

Subject Facility:

HAYES VALLEY

PROJECT # L953248PO # L9532484

UNKNOWN

SAN MARTIN, CA 95046

Latitude :37.067153 Longitude :121.621249

Submitted

06/28/95

P.O. Box 2181, Austin, TX 78701-2181 Tel (800) 945-9509 Fax (512) 478-5215
505 Huntmar Park Drive, Suite 200, Herndon, VA 22070 Tel (800) 989-0402 Fax (703) 834-0606

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06/28/95

U.S. ENVIRONMENTAL PROTECTION AGENCY

CERCLIS Facilities

The Comprehensive Environmental Response, Compensation and Liability Information System(CERCLIS) is a compilation of records regarding those facilities which the EPA has identified as having actual or suspected uncontrolled releases of hazardous substances, contaminants, or pollutants as reported by states, municipalities, private companies, and private citizens. Each incident undergoes a series of events that determine the severity of the contamination from discovery and preliminary assessment to site inspection and possibly the hazard ranking system which will determine whether or not the site will be considered for inclusion on the NPL(National Priorities List).

NO SITES FOUND WITHIN AREA OF REVIEW

06/28/95

CALIFORNIA
Environmental Protection Agency
Department of Toxic Substance Control

State Sites

"List of Active Annual Workplan Sites(CALSITES)"

NO SITES FOUND WITHIN AREA OF REVIEW

06/28/95

U.S. ENVIRONMENTAL PROTECTION AGENCY

National Priority List

The NPL, or Federal Superfund as it is commonly known, is composed of the nation's most hazardous sites which require remediation. This list is created from the CERCLIS database and lists over 1150 sites nationwide. After a facility has been identified as a CERCLIS site, the EPA conducts an assessment of the property. The degree of contamination found determines whether the site is placed on the NPL or is referred to the state for further action under state programs(see State Superfund).

NO SITES FOUND WITHIN AREA OF REVIEW

06/28/95

U.S. ENVIRONMENTAL PROTECTION AGENCY

RCRIS Facilities

The Resource Conservation Recovery Information System(RCRIS) is a nationwide database created to maintain and regulate facilities that handle hazardous waste. The RCRIS database replaced the HWDMS (Hazardous Waste Data Management System) in September of 1992 as the major system supporting the implementation of RCRA(Resource Conservation and Recovery Act)

NO SITES FOUND WITHIN AREA OF REVIEW

06/28/95

CALIFORNIA

State Water Resources Control Board

Registered Storage Tanks

NO SITES FOUND WITHIN AREA OF REVIEW

06/28/95

CALIFORNIA

Regional Water Resources Control Board

Leaking Registered Storage Tanks

NO SITES FOUND WITHIN AREA OF REVIEW

06/28/95

U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Solid & Hazardous Waste

Emergency Response Notification System

The Emergency Response Notification System(ERNS) is a national computer database and retrieval system used to store information on accidental releases of oil and hazardous substances. The information stored in this database is acquired through the National Response Center that tracks over 35,000 incidents per year. A form is filled out for each incident that requires information such as: discharger name, date of release, amount released and type of substance released. The information in this database is available from 1987.

NO SITES FOUND WITHIN AREA OF REVIEW

06/28/95

CALIFORNIA
Integrated Waste Management Board
Clean Water Program

State Solid Waste Landfills

"Active and Closed Landfills (SWIS and SWAT)"

NO SITES FOUND WITHIN AREA OF REVIEW

APPENDIX

FACILITY ID	TYPE	FACILITY NAME	FACILITY ADDRESS	ZIP CD	FLAG
CAD980637722	CERCLIS	PACHECO PASS LDFL	0.7 MI NE OF BLOOMFIELD RD	95020	
CAD981416043	CERCLIS	PG&E GAS PLANT GILROY	6TH & RR ST	95020	
90-8979	ERNS	UNKNOWN		95020	
90-9718	ERNS	UNKNOWN		95020	
91-2312	ERNS	UNKNOWN		95020	
91-2379	ERNS	UNKNOWN		95020	
94-2362	ERNS	UNKNOWN		95020	
90-7135	ERNS	FARM LAND OIL		SAN M	
03126	ERNS			SAN J	
04719	ERNS			SAN J	
01891	ERNS			SAN J	
06671	ERNS			SAN J	
08799	ERNS			SAN J	
10741	ERNS			SAN J	
12029	ERNS			SAN J	
12868	ERNS			SAN J	
12871	ERNS			SAN J	
87-1782	ERNS	UNKNOWN/RECYCLING(UNIT)		SAN J	
87-1953	ERNS	GREAT WESTERN CIRCUIT BOARDS		SAN J	
87-1956	ERNS	UNK		SAN J	
87-2205	ERNS	(RP) C SOLVIG CO		SAN J	
87-2456	ERNS	UNKNOWN		SAN J	
87-2679	ERNS	UNKNOWN PERSON		SAN J	
87-2613	ERNS	UNKNOWN		SAN J	
87-3625	ERNS	UNK		SAN J	
13805	ERNS			SAN J	
14793	ERNS	UNKNOWN		SAN J	
87-4666	ERNS	UNK DUMPED		SAN J	
87-4835	ERNS	UNK DUMPED		SAN J	
87-4990	ERNS	UNK		SAN J	
88-170	ERNS	UNK (DUMPED)		SAN J	
87-4017	ERNS	UNKNOWN		SAN J	
87-4012	ERNS	UNK		SAN J	
87-4108	ERNS	UNK		SAN J	
87-4490	ERNS	UNK(DUMPED)		SAN J	
02000	ERNS	UNK		SAN J	
88-150	ERNS	UNK VEHICLE		SAN J	
88-251	ERNS	PRIVATE VEHICLE		SAN J	
88-273	ERNS	UNK TANK TRUCK		SAN J	
88-1599	ERNS	UNK DUMPED		SAN J	
88-2311	ERNS	UNK		SAN J	
88-3101	ERNS	UNK.		SAN J	
88-3174	ERNS	UNK.		SAN J	
88-3789	ERNS	UNK		SAN J	
88-3953	ERNS	UNK		SAN J	
88-4103	ERNS	UNK		SAN J	
88-4287	ERNS	UNK		SAN J	
88-4547	ERNS	UNK		SAN J	
00951	ERNS			SAN J	
89-218	ERNS	UNK		SAN J	
89-219	ERNS	UNK		SAN J	
89-260	ERNS	UNK		SAN J	
89-365	ERNS	UNK		SAN J	
89-367	ERNS	UNK		SAN J	
89-386	ERNS	UNK		SAN J	
89-1425	ERNS	UNK		SAN J	
89-1485	ERNS	UNK		SAN J	
89-1682	ERNS	UNK		SAN J	
89-1804	ERNS	UNK		SAN J	
89-1853	ERNS	UNK		SAN J	
89-2458	ERNS	UNK		SAN J	
89-3073	ERNS	MATLOCK TRUCKING		SAN J	
15475	ERNS			SAN J	
89-3171	ERNS	UNK		SAN J	
89-3327	ERNS	UNK		SAN J	
89-3374	ERNS	UNK		SAN J	
16731	ERNS			SAN J	
89-3600	ERNS	UNK		SAN J	
89-3726	ERNS	UN K		SAN J	

APPENDIX

FACILITY ID	TYPE	FACILITY NAME	FACILITY ADDRESS	ZIP CD	FLAG
89-3933	ERNS	UNK		SAN J	
18354	ERNS			SAN J	
18377	ERNS			SAN J	
18506	ERNS			SAN J	
19326	ERNS			SAN J	
90-6567	ERNS	CITY PUBLIC WORKS		SAN J	
90-6775	ERNS	CITY OF SAN JOSE		SAN J	
90-10064	ERNS	UNKNOWN		SAN J	
44694	ERNS	CHEVRON USA		SAN J	
91-0150	ERNS	UNKNOWN		SAN J	
91-0972	ERNS	UNKNOWN		SAN J	
91-2448	ERNS	UNKNOWN		SAN J	
69515	ERNS			SAN J	
91-3716	ERNS	UNKNOWN		SAN J	
91-4083	ERNS	UNKNOWN		SAN J	
77000	ERNS			SAN J	
92-1935	ERNS	UNKNOWN		SAN J	
92-2039	ERNS	UNKNOWN		SAN J	
92-3225	ERNS	UNKNOWN		SAN J	
92-3225A	ERNS	UNKNOWN		SAN J	
92-4688A	ERNS	UNKNOWN		SAN J	
217977	ERNS			SAN J	
234315	ERNS			SAN J	
88-4138	ERNS	UNK		SAN J	
88-4034	ERNS	SAN JOSE STATE UNIV P MOSS	1 WASHINGTON SQ	SAN J	
76496	ERNS	SOLVENT SERVICES	1021 BERRYESSA DR	SAN J	
88-4454	ERNS	USA PETROLEUM CORP	10901 E CAPITOL EXPRESSWAY	SAN J	
89-135	ERNS	VSLI TECHNOLOGY	1101 MCKAY DR	SAN J	
58560	ERNS	F.M.C. CORP	1125 COLEMAN AVE	SAN J	
53262	ERNS	FMC CORP.	1125 COLEMAN AVE BOX 367	SAN J	
88-2776	ERNS	FETZER VINEYARD	1150 DEL ARBRES RD	SAN J	
92-5215	ERNS	ARRAY TECH	1297 PARKMOOR AVE	SAN J	
87-3787	ERNS	GARY BROWN	1305 TILLMAN	SAN J	
90-6953	ERNS	CITY MAINTENANCE	1404 MABURY ROAD	SAN J	
88-2410	ERNS	SYNCOR INT'L	1445 KOLL CIRCLE	SAN J	
90-6715	ERNS	SANTA CLARA COUNTY TRANSIT	1555 BERGER DR	SAN J	
88-2869	ERNS	ALTUS BATTERY CO	1610 CRANE COURT	SAN J	
02251	ERNS	PACIFIC BELL	1615 FOXWORTHY AVENUE (ROOM 207	SAN J	
88-2507	ERNS	CAL-AIR (D. WYKOFF)	1625 ALAMEDA	SAN J	
87-3080	ERNS	(RP)EXXON (KENT SANDERSON)	1646 NO CA BLVD SUITE 210	SAN J	
88-2694	ERNS	PITZER AUTOMOTIVE	1660 MONTEREY HWY	SAN J	
87-2100	ERNS	(RP) UNOCAL (STATION)	1690 SARATOGA RD	SAN J	
08724	ERNS	PACIFIC GAS AND ELECTRIC	1864 SANTA TERASA DR	SAN J	
88-411	ERNS	A CLASSIC FINISH	1915 W SAN CARLOS	SAN J	
87-2256	ERNS	(RP)ALLIED OIL&PUMPING	2002 O'TOOLE	SAN J	
89-3470	ERNS	IRM CORP/MITCHELL P	2020 S 10TH ST	SAN J	
87-2530	ERNS	(RP)SANMINA (S.BRUTIN)	2101 OTOOL ROAD	SAN J	
90-7005	ERNS	UNITED VAN LINES	2138 O'TOOLE AVENUE	SAN J	
88-3156	ERNS	EXCEL MICROELETRONICS	2150 COMMERCE DR	SAN J	
87-2427	ERNS	(RP)SOUTHERN PACIFIC PIPE LN	2150 CRUZE DR	SAN J	
07463	ERNS	IT CORP	221 EAST D ST	SAN M	
39253	ERNS	CONNER PERIPHALS CO	2221 OLD OAKLAND RD	SAN J	
44344	ERNS	CONNER PERIPHERALS CO	2221 OLD OAKLAND RD	SAN J	
91-3151	ERNS	DINA VISION	2365 TRAGON DR BLDG E	SAN J	
73327	ERNS	GLASFORMS INC.	271 BERNARD AVE	SAN J	
88-4199	ERNS	SAN JOSE GENERATING PLANT	283 S 10TH ST	SAN J	
90-9628	ERNS	FMC CORP.	328 BROKAW RD	SAN J	
89-94	ERNS	HEWLETT PACKARD CO	350 W TRIMBLE RD	SAN J	
91-0854	ERNS	MOUNTAIN SIDE TRANSPORT, INC.	400 SLORIN-PERKINS	SAN J	
89-95	ERNS	LEASEWAY TRUCKING C WILLIAMS	4400 FLORIN PERKINS RD	SAN J	
88-221	ERNS	IBM *87	5600 COTTLE RD	SAN J	
88-4219	ERNS	ANO PIATE METAL FINISHING	568 CHARCOT AVE	SAN J	
87-1730	ERNS	UNITED TECHNOLOGIES	600 METCALF RD	SAN J	
89-214	ERNS	CENTRAL CONCRETE SUPPLY	610 MCKENDRIE	SAN J	
88-4070	ERNS	TOSHIBA R GUNDO	611 B RIVER OAKS PARKWAY	SAN J	
16020	ERNS	SOLVENT SERVICE, INC	660 LENFEST RD	SAN J	
16656	ERNS	SOLVENT SERVICE INC.	660 LENFEST RD	SAN J	
88-125	ERNS	SAN JOSE RADIATOR	665 LINCOLN	SAN J	
89-1660	ERNS	SANTA CLARA MED CENTER	751 S BASCOM AVE	SAN J	
88-3263	ERNS	BAY AREA MACK	757 COMMERCIAL ST	SAN J	

APPENDIX

FACILITY ID	TYPE	FACILITY NAME	FACILITY ADDRESS	ZIP CD	FLAG
89-1819	ERNS	DEPT PW SAN JOSE	801 N 1ST ST	SAN J	
89-914	ERNS	PORTOLA CLEANERS	805 STATE ST	SAN J	
64521	ERNS	EAST SIDE UNION HIGH SCH	830 N CAPITOL AVE	SAN J	
88-152	ERNS	SOUTHERN PACIFIC PIPELINE	888 S FIGUEROA ST	SAN J	
88-3801	ERNS	TERRA FAUNA G MCCARTHY	888 STOCKTON AVE	SAN J	
88-2916	ERNS	AMJRONICS	90 BONA VENTURA DRIVE	SAN J	
89-717	ERNS	BERGREN AUTO ELECTRIC	985 W JULIAN ST	SAN J	
09485	ERNS	LEVINE METAL CORP	BARNARD AVENUE	SAN J	
12504	ERNS	UNION 76	CORNER OF MORE PARK & WINCHESTE	SAN J	
88-4413	ERNS	USA GAS STATION	MCLAUGHLIN & CAPITOL EXPY	SAN J	
88-3527	ERNS	SIERRA PRECAST INC.	P O BOX 53207	SAN J	
87-4227	ERNS	G&H STEEL SERVICE INC.	PO BOX 27	SAN J	
11968	ERNS	UNITED TECHNOLOGIES CHEMICAL	PO BOX 49028	SAN J	
87-3652	ERNS	ECOLAB (ROGER KORTE)	PO BX 3175 640 LENFAST RD	SAN J	
09622	ERNS	UNITED TECHNOLOGIES	POB 49028	SAN J	
87-1862	ERNS	UNITED TECH CHEM SYSTEMS	POS BOX 50015	SAN J	
87-1983	ERNS	CITY OF SAN JOSE(G.LYNCH)	RM 460 801 NTH FIRST ST	SAN J	
219644	ERNS		SHELTON WAY	SAN J	4
CA_2CITYSAN	LRST	CITY SJ: PENITENCIA CREEK PAR		SAN J	
CA86D	LRST	FILICE ESTATE VINYARDS	10270 MONTEREY RD	SAN J	
CA_2COYO1084GIL	LRST	COYOTE LAKE PARK	1084 COYOTE LAKE RD	95020	
CA331	LRST	CAL TRANS-GILROY MAINT. STA.	11155 UNO ST	95020	
CA_2LICO1424SAN	LRST	LICO DISTRIBUTING	14245 MONTEREY HWY	95046	4
CA329	LRST	LICO DISTRIBUTING	14245 MONTEREY HWY	95046	4
CA_2SANJ1590SAN-2	LRST	SAN JOSE FIRE STATION #25	1590 GOLD ST	SAN J	
CA_2BPOI2000SAN	LRST	BP OIL	2000 EL CAMINO REAL	SAN J	
CA454	LRST	GILROY TRANSIT MIX, INC.	25 BUENA VISTA AVE	95020	2
CA_2THER2530SAN	LRST	THERMA INC	2530 LUNDY	SAN J	
CA_2ORIG3025SAN	LRST	ORIGINAL JOES	302 51ST ST	SAN J	
CA_2CITY320HSAN	LRST	CITY OF SAN JOSE	320 HARRON ST	SAN J	
CA_2FMCC333JSAN	LRST	FMC CORP. SJ ORDNANCE PLANT	333 JULIAN ST	SAN J	
CA_2ZYCO390BSAN	LRST	ZYCON CORPORATION PROPERTY	390 BELLOMY STREET	SAN J	
CA1064	LRST	CERTIFIED EGG	4140 CANADA RD	95020	4
CA327-2	LRST	FELICE, CRAIG	475 THOMAS LN	95020	4
CA_2BABB5100SAN	LRST	BABBAGE, POOLE & BABBAGE	510 OAKMEAD PKWY	SAN J	
CA_2CHEV5887GIL	LRST	CHEVRON	5887 MONTEREY RD	95020	4
CA790-1	LRST	CHEVRON SS#9-6293	5887 MONTEREY RD	95020	4
CA2441	LRST	FRANK VIGNA	670 DENIO AVE	95020	4
CA1077-2	LRST	SCVWD LLAGAS CRK	8255 CHURCH ST	95020	
CA786-1	LRST	GREEN VALLEY ENTERPRISES	8930 WATSONVILLE RD	95020	2
CA_2SOUT90STSAN	LRST	SOUTHLAND	90 STERN AVE	SAN J	
CA_2UNKN9605SAN	LRST	UNKNOWN	9605 MONTEREY HWY	SAN J	
CA_2SJRAMARKSAN	LRST	SJRA HOTEL EAST/CONVENTION CT	MARKET	SAN J	
CA_2FOSTMONTSAN	LRST	FOSTER GROUP PARTNERSHIP	MONTEREY RD	SAN J	
CA_2PACIMTUMSAN	LRST	PACIFIC BELL	MT UMHUMUM/HICKS RD	SAN J	
CA330-1	LRST	CAL TRANS MAINTENANCE STA. #2	PACHECO PASS HWY	95020	
CA_2SANTSANJSAN	LRST	SANTA FE PACIFIC PIPELINE	SAN JOSE TERMINAL	SAN J	
CA_2BENSSANTSAN	LRST	BENSEN PROPERTY	SANTA TERESA ST	SAN J	
CA_2GOLDSTEVSAN	LRST	GOLDEN WEST BUILDERS	STEVENS CRK	SAN J	
CA_2CANNTAYLSAN	LRST	CANNERY PARK	TAYLOR E	SAN J	
CA581	LRST	BARBERI PROPERTY-UVAS CREEK	THOMAS RD	95020	
CA43360089	NPL	FAIRCHILD SEMICONDUCTOR (S. S	101 BERNAL RD	SANTA	
CA43360032	NPL	INTERSIL	10910 N TANTAU AVE	SANTA	
CA43380014	NPL	MONOLITHIC MEMORIES	1165 E ARQUES AVE	SANTA	
CA43360084	NPL	SPECTRA PHYSICS, INC.	1250 W MIDDLEFIELD RD	SANTA	
CA43360082	NPL	TELEDYNE SEMICONDUCTOR	1300 TERRA BELLA AVE	SANTA	
CA43300026	NPL	LORENTZ BARREL & DRUM COMPANY	1515 S 10TH ST	SANTA	V
CA43280119	NPL	JASCO CHEMICAL CO	1710 VILLA ST	SANTA	
CA43350085	NPL	INTEL CORPORATION (SANTA CLAR	2880 NORTHWESTERN PKY	SANTA	
CA43360029	NPL	NATIONAL SEMICONDUCTOR CORP	2900 SEMICONDUCTOR DR	SANTA	V
CA43350086	NPL	INTEL MAGNETICS/MICRO STORAGE	3000 OAKMEAD VILLAGE DR	SANTA	
CA43360090	NPL	APPLIED MATERIALS	3050 BOWERS AVE	SANTA	
CA43990002	NPL	SYNERTEK, INC. (BUILDING 1)	3050 CORONADO DR	SANTA	
CA43360081	NPL	RAYTHEON CORPORATION	350 ELLIS ST	SANTA	
CA43350080	NPL	INTEL CORPORATION (MOUNTAIN V	365 E MIDDLEFIELD RD	SANTA	
CA43380013	NPL	FAIRCHILD SEMICONDUCTOR/MT. V	464 ELLIS ST	SANTA	
CA43350082	NPL	HEWLETT-PACKARD (620-640 PAGE	620 PAGE MILL RD	SANTA	V
CA43360094	NPL	TRW MICROWAVE, INC. (BUILDING	825 STEWART DR	SANTA	

APPENDIX

FACILITY ID	TYPE	FACILITY NAME	FACILITY ADDRESS	ZIP CD	FLAG
CA43360092	NPL	ADVANCED MICRO DEVICES, INC.	901 THOMPSON PL	SANTA	
CA43360095	NPL	ADVANCED MICRO DEVICES # 915	915 DEGVIGNE DR	SANTA	
CA43490060	NPL	SOUTH BAY ASBESTOS AREA	FT OF LIBERTY ST GUADALUPE RIV	SANTA	
CA43350001	NPL	WESTINGHOUSE ELECTRIC CORP. (	HENDY AVE & FAIROAKS AVE	SANTA	
CA43450001	NPL	MOFFETT NAVAL AIR STATION	MOFFETT FIELD (10 MILES NORTH O	SANTA	
CA43360083	NPL	CTS PRINTEX	PLYMOUTH & COLONY STS	SANTA	V
CAD124949496	RCRIS	KASTOR'S AUTO & TRUCK	13165 A MONTEREY WAY	95046	
CAT080010879	RCRIS	REPUBLIC POWDERED METALS INC	20 CASEY LN	95020	4
CAD980695381	RCRIS	LOOMIX INC	25 BUENA VISTA AVE	95020	2
CAD980884720	RCRIS	GENTRY FOODS CORP	255 FITZGERALD AVE	95020	
CAD981690407	RCRIS	SANDOZ AGRO INC	5653 MONTEREY RD	95020	4
CAD981410921	RCRIS	EXXON SERVICE STATION NO 7-31	700 1ST/MILLER	95020	
CAD982500787	RCRIS	SCREENPLAY SILK SCREENING	8380 CHURCH ST STE G	95020	4
CAD981402571	RCRIS	SHELL STATION #204-2988-0105	8385 N. MONTEREY/WILBURN	95020	
CAD983599457	RCRIS	KELLIS CLEARNERS	8400 A CHURCH ST	95020	
CAD981402514	RCRIS	SHELL STATION #204-2988-0402	850 PACHECO PASS HWY # 10	95020	4
CAD066522129	RCRIS	HOPE REHABILITATION SERVICES	8855 MURRAY AVE	95020	4
CAT080024656	RCRIS	PACIFIC BELL	L7S BUENA VISTA	95020	
CAT080021140	RCRIS	PACIFIC BELL	L8S THOMAS ROAD @ HIGHWAY 101	95020	
CAT080019334	RCRIS	PACIFIC BELL	L9S GREENFIELD FARMS @ HWY 101	95020	
CARIVE1RISAN	RST	RIVER OAKS PUMP STATION	1 RIVER OAKS PY	SAN J	
CAGOUI10PGIL	RST	GOUILON GAS	10 PONON AVE	95020	
CAS.G.101GIL	RST	S.G. BORELLO & SON'S INC	101 HWY & CASTOR VLY RD	95020	
CAGEOR1086GIL	RST	GEORGE NISHIMATSU	10860 006TH AVE	95020	
CAPETE1105GIL	RST	PETER O GLUHAICH FARMS	1105 NEW BOLSA RD	95020	
CAGILR1115GIL	RST	GILROY	1115 N NAME UNO ST	95020	
CALEO1147SAN	RST	LEO H. KNABKE	11470 TURLOCK AVE	95046	4
CAWELL121SAN	RST	WELLS FARGO BUILDING #9460	121 PK CTR PLZ HIRIS	SAN J	
CASAN1300SAN-2	RST	SAN MARTIN WINERY	13000 DEPOT ST	SAN M	
CALICO1424SAN	RST	LICO DISTRIBUTING CO. INC.	14245 MONTEREY HWY	95046	4
CAEDWA1470SAN	RST	EDWARD J. LAZZARINI	14700 WATERS ST	95046	
CAJOE1515GIL	RST	JOE F. YOUNG FARMS	1515 W HILLVIEW CT	95020	4
CANORT1661SAN	RST	NORTECH PUMP STATION	1661 NORTECH PY	SAN J	
CAYELL1700SAN	RST	YELLOW FREIGHT SYSTEM	1700 MONTAGUE EX	SAN J	
CAREPU20CGIL	RST	REPUBLIC POWDERED METALS, INC	20 CASEY LN	95020	4
CAGILR25BGIL	RST	GILROY TRANSIT MIX INC	25 BUENA VISTA AVE	95020	2
CAESCO2695GIL	RST	ESCOBAR RANCH	2695 FERGUSON RD	95020	4
CAKORF3250GIL	RST	KORFF FARM	3250 ROOP RD	95020	4
CAERNE3385GIL	RST	ERNEST G. JONASSON	3385 DRYDEN AVE	95020	4
CATRAN450GIL	RST	TRANS VALLEY TRANSPORT INC.	450 E 9TH ST	95020	2
CAJOE5365GIL	RST	JOE FELICE FARM	5365 MONTEREY RD	95020	4
CA96295887GIL	RST	96293	5887 MONTEREY RD # 96293	95020	4
CAFRAN670GIL	RST	FRANK VIGNA	670 DENIO AVE	95020	4
CASJ675SAN	RST	S J HOSP & HEALTH CTR	675 E SANTA CLARA ST A&B	SAN J	
CAFARO80CGIL	RST	FAROTTE CONSTRUCTION CO.,INC.	80 CASEY LN	95020	4
CAVIEI850GIL	RST	VIEIRA SERVICES CO., INC	850 PACHECO PASS HWY	95020	4
CACOYOGILRGIL	RST	COYOTE FFS	GILROY HOTSPRINGS/CA RD	95020	
CAHIGHHIGHGIL	RST	HIGHWAY 152 FUEL DEPOT	HIGHWAY 101 & 152	95020	
CACATTJAMIGIL	RST	CATTLE RANCH	JAMIESON RD	95020	4
CAOAKMRENASAN	RST	OAKMEAD PUMP STATION	RENAISSANCE DR	SAN J	
CAJACKROOPGIL	RST	JACK BOYTO	ROOP RD	95020	
CA43-AN-0015	STLNDFIL	GUADALUPE SANITARY LANDFILL	15999 GUADALUPE MINES RD	SAN J	
CA43-AN-0008	STLNDFIL	KIRBY CANYON RECYCL & DISP FA	910 SCHELLER AVE	SAN J	
CA43-AN-0010	STLNDFIL	MARTIN PARK LANDFILL	FORESTDALE AVE	SAN J	
CA43-AN-0001	STLNDFIL	OWENS FIBERGLASS CO	LOS ESTEROS RD	SAN J	
CA43-AN-0007	STLNDFIL	ZANKER RD (NINE PAR) SANITARY	LOS ESTEROS RD && ZANKER RD	SAN J	
CA43-AN-0004	STLNDFIL	MARSHLAND SOLID WASTE FACILIT	NW HWY 237 & GOLD ST ALVISO	SAN J	
CA43-AN-0011	STLNDFIL	COYOTE-HELLYER PARK LANDFILL	PALISADE DR	SAN J	
CA43-AN-0012	STLNDFIL	STORY RD LANDFILL	REMILLARD COURT	SAN J	
CA43-AN-0009	STLNDFIL	ROBERTS AVE LANDFILL	ROBERTS AVE	SAN J	

06/28/95

SUMMARY OF FINDINGS

for

PROJECT # L953248PO # L953248
UNKNOWN
SAN MARTIN, CA 95046

Zips Searched : 95020, 95046
Cities Searched : SAN MARTIN, SAN JOSE, LLAGAS-UVAS
Counties Searched : SANTA CLARA

DATABASE	RADIUS REQUESTED	RECEIVED DATE OF DATA BY AIC*	ACTUAL SEARCH METHOD	# SITES FOUND	APPROX. DIST. FROM SITE, MILES 0-1/8	1/8-1/4	1/4-1/2	1/2-1	>1
CERCLIS	1/2	03/30/95	RADIUS	0	0	0	0	0	0
STSITE	1	04/18/94	RADIUS	0	0	0	0	0	0
NPL	1	01/30/95	RADIUS	0	0	0	0	0	0
TSD	1	03/16/95	RADIUS	0	0	0	0	0	0
RCRIS	1/4	03/16/95	RADIUS	0	0	0	0	0	0
RCEVAL	1/4	03/16/95	RADIUS	0					
RCVIOL	1/4	03/16/95	RADIUS	0					
RST	1/4	06/15/94	RADIUS	0	0	0	0	0	0
LRST	1/2	03/14/95	RADIUS	0	0	0	0	0	0
ERNS	1/4	09/23/94	RADIUS	0	0	0	0	0	0
LANDFILLS	1/2	12/12/94	RADIUS	0	0	0	0	0	0

* AIC believes that it performs all appropriate inquiries to obtain the most current information from each of the applicable databases consistent with or exceeding good customary or commercial practice. *

List of Streets within the Area of Review

This list includes all street names available from the U.S. Census Bureau's TIGER digital map file series. It is another reference to aid in determining if a site exists within the area of review. This list should not be used as the sole source to locate a site since there are cases where a street is named incorrectly or is labeled 'unknown'.

Street Name	Street Name
Coolidge Ave	
Cox Ave	
Harding Ave	
Highland Ave	
Llagas Creek	
Turlock Ave	
UNNAMED NONVISIBLE FEATURE	

APPENDIX B

ENVIRONMENTAL RISK INFORMATION AND IMAGING SERVICES REPORT

APPENDIX L

Electromagnetic Fields (EMFs) Report

Prepared by

PG&E

July 1995

Pacific Gas and Electric Company

Rich Cashdollar, Director GM&C
123 Mission St., Room 2514
San Francisco, CA 94119
(415) 973-7041
Fax: (415) 973-7161

June 30, 1995

RECEIVED
JUL 10 1995
NOLTE and ASSOCIATES
SAN JOSE

PG&E

Bert Virrips
Nolte and Associates, Inc.
60 South Market St., Suite 300
San Jose, CA 95113

Dear Bert:

Enclosed is the report you requested addressing power line frequency electric and magnetic fields (EMF) and the results of magnetic field recordings near transmission power lines that traverse the Hayes Ranch site in Morgan Hill.

Also enclosed is our standard EMF information package that we send to our customers who have interest in the subject.

Please call me at (510) 874-2474 if I can be of further assistance.

Sincerely,

Dave Gregory

Enclosure

PURPOSE

This report discusses"power line frequency" electric and magnetic fields (EMF)--specifically, what these fields are and the potential link to human health. It also shows the results of measurements taken of magnetic field strength from transmission power lines that cross part of the Hayes Valley Development Project located in Morgan Hill, CA.

BACKGROUND & SETTING

A letter dated June 22, 1995 (copy attached) authorized and requested PG&E to conduct EMF measurements at the Hayes Ranch site.

PG&E owns and operates nearby electric transmission and distribution power lines. Transmission lines are those rated at greater than 50,000 volts (50 kV); distribution lines are those rated at less than 50 kV.

Two vertically mounted transmission line circuits--three wires per circuit and two circuits per tower--were specifically requested to be measured. Figures 1, 2 and 3 show the area and lines in question. Each circuit is rated and presently operated at 115,000 volts (115 kV). The westernmost line runs from Metcalf substation to Salinas, while the easternmost line runs from Morgan Hill to Llagas substation.

ELECTRIC AND MAGNETIC FIELDS (EMF)

Electric and magnetic fields (EMF) are invisible fields of force created by electric voltage (electric fields) and by electric current (magnetic fields). EMF exist wherever there is electricity -- in appliances, homes, schools and offices, and in power lines (including those buried underground).

Electromagnetic fields occur along a spectrum of frequencies (or wavelengths). The amount of energy in such fields is proportional to frequency, i.e., the higher the frequency, the higher the energy. EMF from power lines and most appliances have much lower frequency, and therefore energy, than microwaves or X-rays, for example. Microwave energy passes through and is absorbed by most materials, and is often sufficient to make them hot. X-ray energy actually breaks apart the molecules that contain genes, which is why excessive X-ray exposure can lead to mutations and cancer. EMF from power lines do not have enough energy to either effectively heat or break apart molecules.

The strength of magnetic fields associated with power lines depends on the amount of current (not voltage), heights and spacing of the conductors or lines above the ground, electrical phasing configurations and balance, actual distance from the lines, and the presence of any other nearby sources of electricity or current.

Magnetic fields pass through most common objects, including the earth, without being significantly affected. Electric fields are affected by objects, especially those that conduct electricity. Normal houses can partially shield electric fields, but not magnetic fields.

POTENTIAL HEALTH EFFECTS

There is no scientific consensus on the actual health effects of exposure to EMF, but it is an issue of public concern.

There are no health-based standards for human exposure to EMF in the United States. Agencies at the federal and state levels, including the U.S. Environmental Protection Agency, have been reviewing the studies conducted thus far to determine if adverse health effects are associated with EMF, and have found no basis for setting health standards. To date, two states -- Florida and New York -- have set magnetic field standards for the edge of transmission rights-of-way. These standards are based on maintaining the "status quo" that presently exists near electric power facilities, until there is definitive information on whether EMF exposure is safe or unsafe.

In California, the Public Utilities Commission (CPUC) has conducted its own investigation into EMF issues. It created an EMF Consensus Group, comprised of 17 representatives from concerned citizens, utilities (including PG&E), trade unions, and health officials to develop recommendations of interim policies that the CPUC and the utilities could pursue relevant to power line frequency EMF (as opposed to radio-cellular frequency EMF). In March, 1992, the Consensus Group submitted its recommendations addressing the areas of overall policy, education and research. In November, 1993 the CPUC issued its decision, which included specific recommendations for policy, and authorization for funding of further research and education. It also concluded that "it is not appropriate to adopt any specific numerical standard in association with EMFs until we have a firm scientific basis for adopting any particular value."

The California Department of Health Services (DHS) has been actively involved in developing and implementing the state's response to the EMF issue. In coordination with national research efforts, the DHS has been participating in or conducting epidemiological and exposure assessment studies. The DHS also has prepared public information material on the EMF issue and has coordinated training sessions for local county health officers and individuals offering EMF measurements.

In September, 1992, Swedish scientists announced the results of an epidemiological study looking at the association between cancer and living in residences adjacent to high voltage (transmission) power lines. Based on its finding of seven or fewer cases of childhood leukemia (out of 436,500 total population) in the highest exposure group, the study concludes that there is an increased risk for leukemia in children who lived near high voltage lines. No associations were found between all cancers in children or cancer in adults and EMF exposures. Past exposure to EMF was calculated using a computer model of the likely loads on power lines; however, from the data taken when spot measurements were actually made in the homes of study participants, no associations were found. This study is currently undergoing review by other researchers, and should be finalized later in 1993.

In contrast to the Swedish study above, the results of the Finnish EMF/childhood cancer study appeared in the October 9, 1993 British Medical Journal with the comparable Danish study as a companion article. The study looked at 134,800 children, who at any time in 1970 through 1989 had lived within 500 meters of a transmission line in a house that had a calculated annual average 50 Hertz magnetic field contribution from the line of 0.1 mG or greater at least once during that period. The authors reached a rather strong conclusion: "Residential magnetic fields of transmission power lines do not constitute a major public health problem regarding childhood cancer. The small numbers do not allow further conclusions about the risk of cancer in stronger magnetic fields."

More research on the EMF issue is under way by both private and public research organizations at the national and international levels. Like the Swedish and Finnish studies mentioned above, some of this research will be epidemiological. Other research will be conducted in the laboratory and in the area of exposure assessment. With magnetic fields, there is still a basic lack of essential information logically linking health effects with exposure dose.

Scientific reviews which have looked at many research projects have concluded that data from epidemiology, whole animal studies and cellular experiments are not sufficient to conclude that the weight of evidence shows an adverse health effect from exposure to power line frequency electric and magnetic fields. Further, none of the review agencies has gone on record in favor of setting standards for exposure. Reviews completed in 1992 or prior include:

- New South Wales Government, Sir Harry Gibbs, February 1991, Inquiry into Community Needs and High Voltage Transmission Line Development.
- The Electromagnetic Health Effects Committee, Public Utilities Commission of Texas, March 1992.
- The Environmental Protection Agency, Science Advisory Board, April 1992.
- The Connecticut Academy of Science and Engineering, April 1992.
- The Health Council of the Netherlands, April 1992.
- The Illinois Department of Public Health and the Illinois Environmental Protection, 1992.
- The National Radiological Protection Board of United Kingdom, 1992.
- The Universities Consortium on Electromagnetic Fields Investigation in Power Line Frequency EMF and Its Risks to Health, Colorado, March 1992.
- The Oak Ridge Universities Consortium, Department of Labor, June 1992.

.POTENTIAL HEALTH EFFECTS (cont'd)

In 1993 and 1994, similar reviews or updates produced the same conclusion:

- National Radiological Protection Board (United Kingdom), March 1993, Electromagnetic Fields and the Risk of Cancer.
- National Institute of Health & Medical Research, INSERM, (France), Synthesis of the Literature on Health Effects from Very Low Frequency EMF.
- Virginia Department of Health, Monitoring of Ongoing Research on the Health Effects of High Voltage Transmission Lines, 8th Annual Report, April 1993.
- Connecticut 1993 Report on Task Force Activities to Evaluate Health Effects from Electric and Magnetic Fields, March 1993, Interagency Task Force Studying EMF (Department of Environmental Protection, Department of Health Services).
- Maryland Dept. of Natural Resources and the Public Service Commission of Maryland, February 1994.
- Advisory Group on Non-Ionizing Radiation of the National Radiological Protection Board, Electromagnetic Fields and the Risk of Cancer, April 1994.

MEASUREMENT RESULTS

On Wednesday, June 28, 1995, from 11:05 a.m. to 11:35 a.m., PG&E recorded power line frequency magnetic field strengths.

Two EMDEX II meters were used. The EMDEX II is a portable, hand-held, three-axes meter that records power line frequency (60 Hertz and associated harmonics) magnetic field intensities versus time or distance. It displays "spot" reads, and collects and stores reads every 1.5 seconds for graphical download.

At the time of these measurements, the Morgan Hill-Llagas circuit was carrying about 200 amps; the Metcalf-Salinas circuit was carrying almost 175 amps. Please note that during the the year there can be significant change in these circuit loads (both magnitude and direction) due to generation feeds from Gilroy Foods.

Figure 4 is a "profile" (i.e., a recording of field strength vs. distance moving away from the circuits at a right angle) taken from west to east. The two dashed lines show field strength directly under each circuit at the dirt road extension of Highland Avenue. The field strength was recorded to be about 2.5 milliGauss (mG). Approximately 60 feet away from the tower centerline, the field strength had dropped to about 2.0 mG. At about 130 feet away from the tower centerline, the field strength had dropped to about 1.0 mG.

Figure 5 is a similar profile but taken from east to west. Results echoed those shown in Figure 4.

Figure 6 is a recording of magnetic field strength vs. time of day. This was taken with the second EMDEX II meter to not only show date and time of reads, but to help validate the reads of the first meter.

These results are valid only for the date and time of day that they have been taken. Measured field strength, or intensity, is only one of several aspects of magnetic fields that science cannot yet say are either biologically important or relevant. Such aspects --any or all of which might play a role in how magnetic fields affect health, if they do --also include:

- time (chronic, long term exposure to low, background levels versus momentary exposure spikes around high field sources;
- frequency and harmonics (the relative harmonic-free 60 Hertz fields typical of transmission lines versus the sometimes high harmonic content of fields associated with distribution lines and customer loads);
- orientation of an alternating magnetic field in relation to the earth's static dc geomagnetic field, which ranges between 250 mG and 600 mG, depending on distance from the poles.

MEASUREMENT RESULTS (cont'd)

Measurements are representative of the conditions on the day and time they were taken. Presently, we do not have a scientific basis for telling the public what risks, if any, are associated with this type of exposure. No long term exposure health-based national, international or state EMF standards or regulations have been developed.

HAYES VALLEY DEVELOPMENT PARTNERS
405 EL CAMINO REAL #127
MENLO PARK, CA 94025

June 22, 1995

Mr. Dave Gregory   via Facsimile #510-874-2669
PG&E
1919 Webster Street, 4th Floor
Oakland, CA 94612

Re: EMF Measurements at Hayes Ranch

Dear Mr. Gregory:

You have my authorization to conduct electromagnetic field measurements at Hayes Ranch, as you discussed with Bert Verrips of Nolte and Associates on June 21, 1995.

A package with site information has been mailed to you separately.

Thank You,

Tom Hix,
Hayes Valley Development Partners

n:\sjo20289\14\wp51\cl1702-d

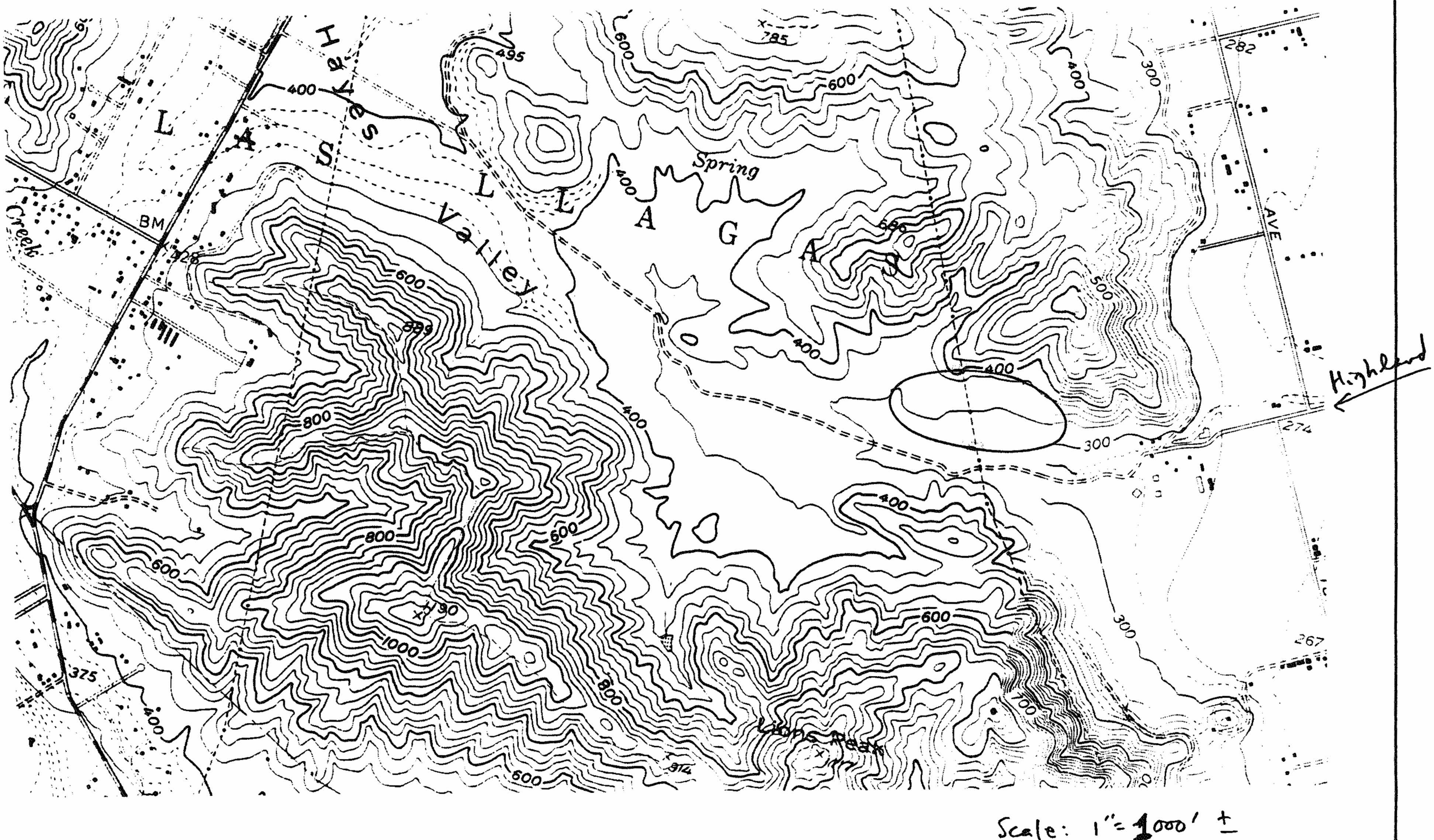
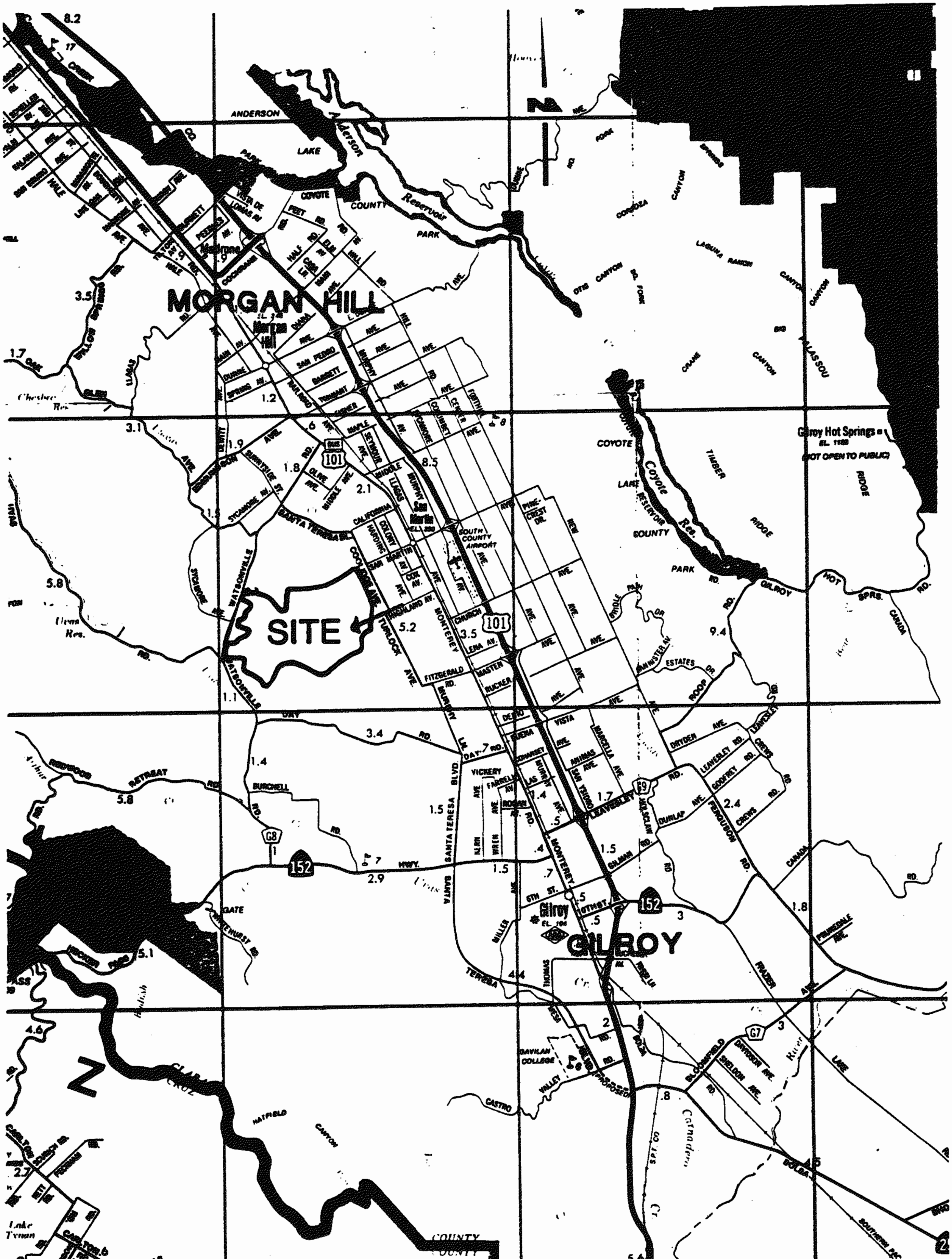

Hayes
Valley
L A S
L L A G A S
Spring
Creek
BM
326
400
495
600
785
282
300
580
500
AVE
Highland
274
889
800
1030
1000
375
914
Lions Peak
267
700
Scale: 1" = 1000' ±

FIGURE 1

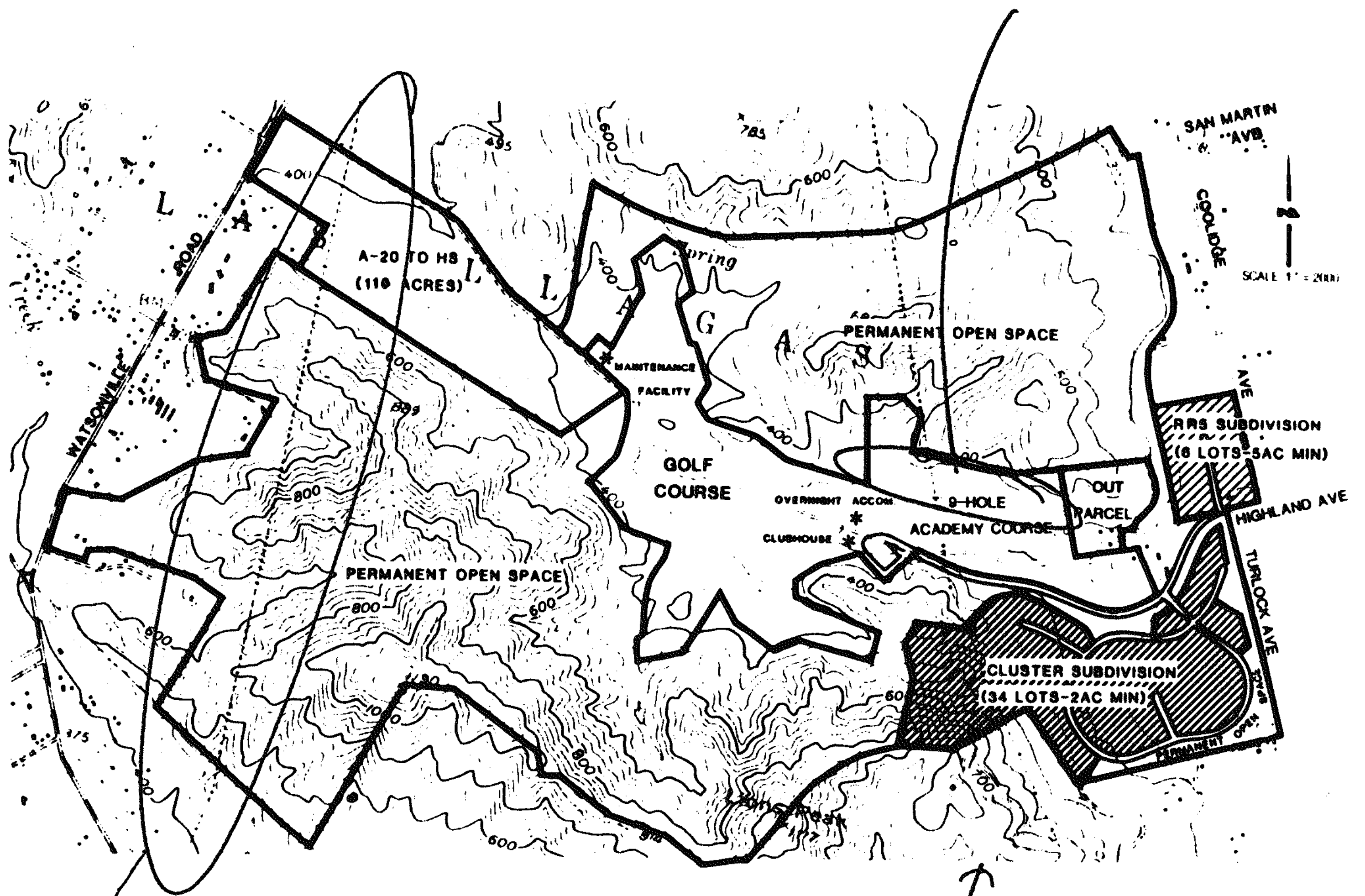


SCALE: 1" = 2 MILES

VICINITY MAP

FIGURE 2

Residential lots (2ac min) now proposed in this area.



115 KV line

no development proposed here (no measurements needed)

HAYES VALLEY DEVELOPMENT PLAN

FIGURE 3

File:HAYESRCH.MDX Data:Broad Resultant Label:Profile 1

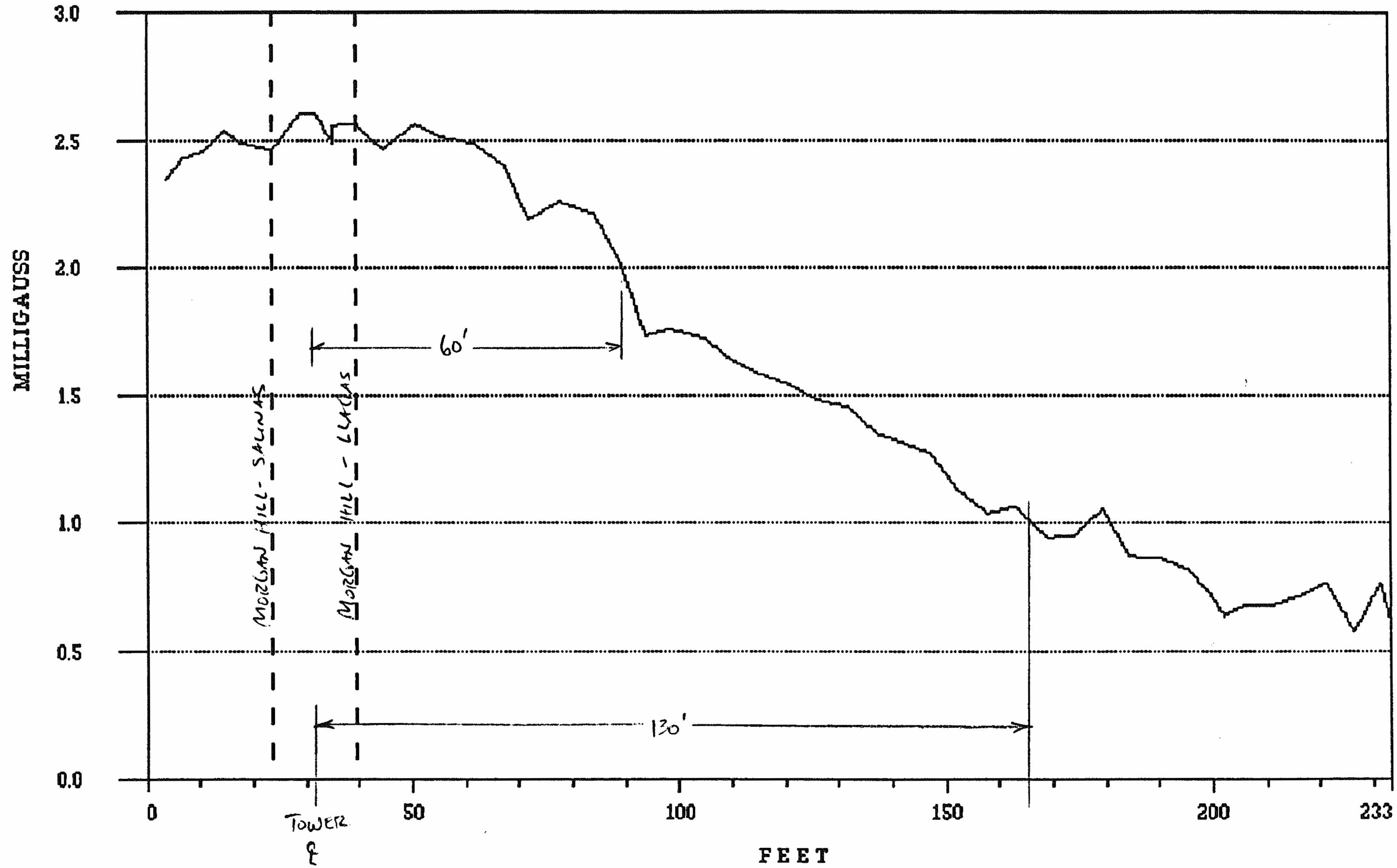


FIGURE 4

File:HAYESRCH.MDX Data:Broad Resultant Label:Profile 2

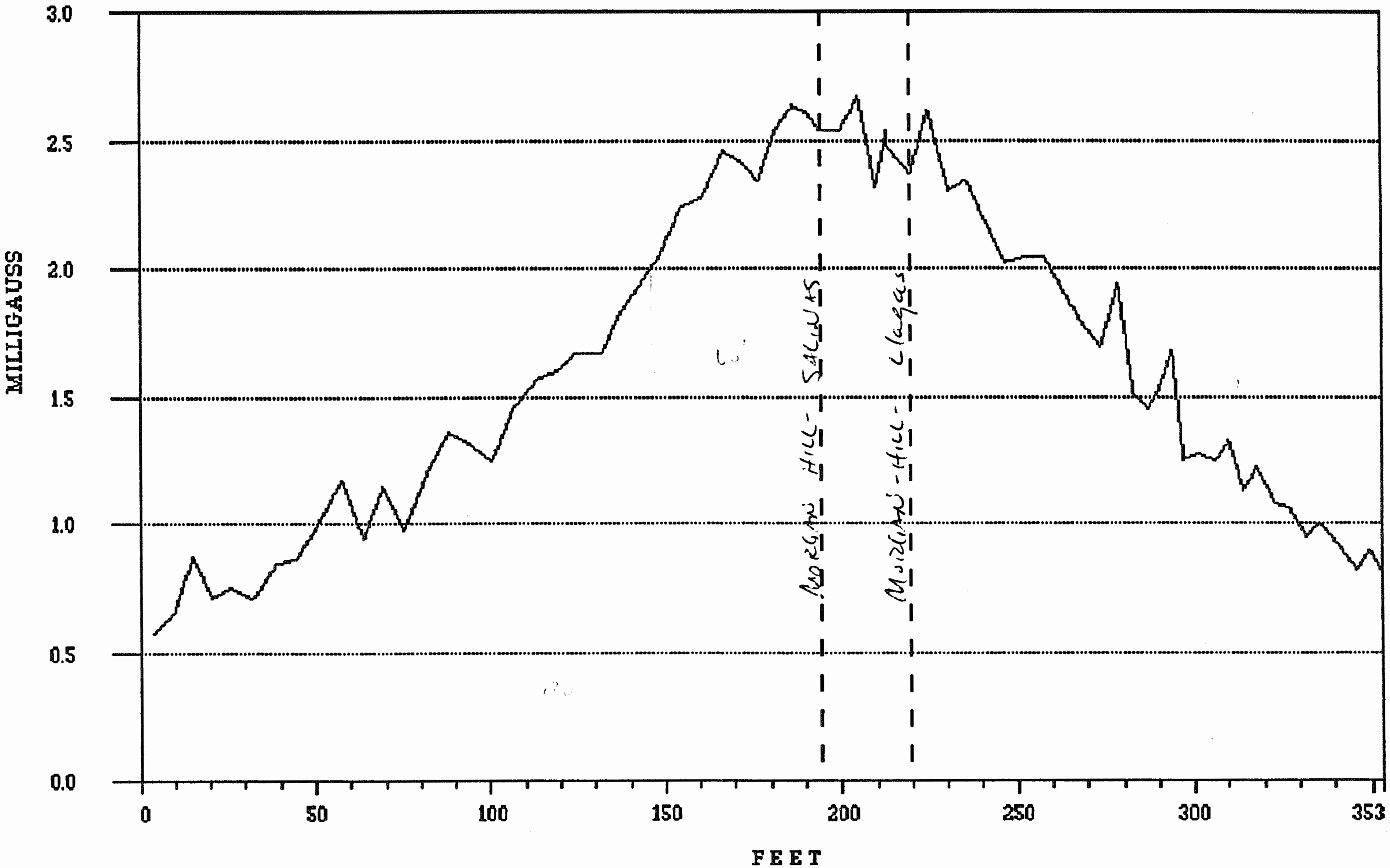


FIGURE 5

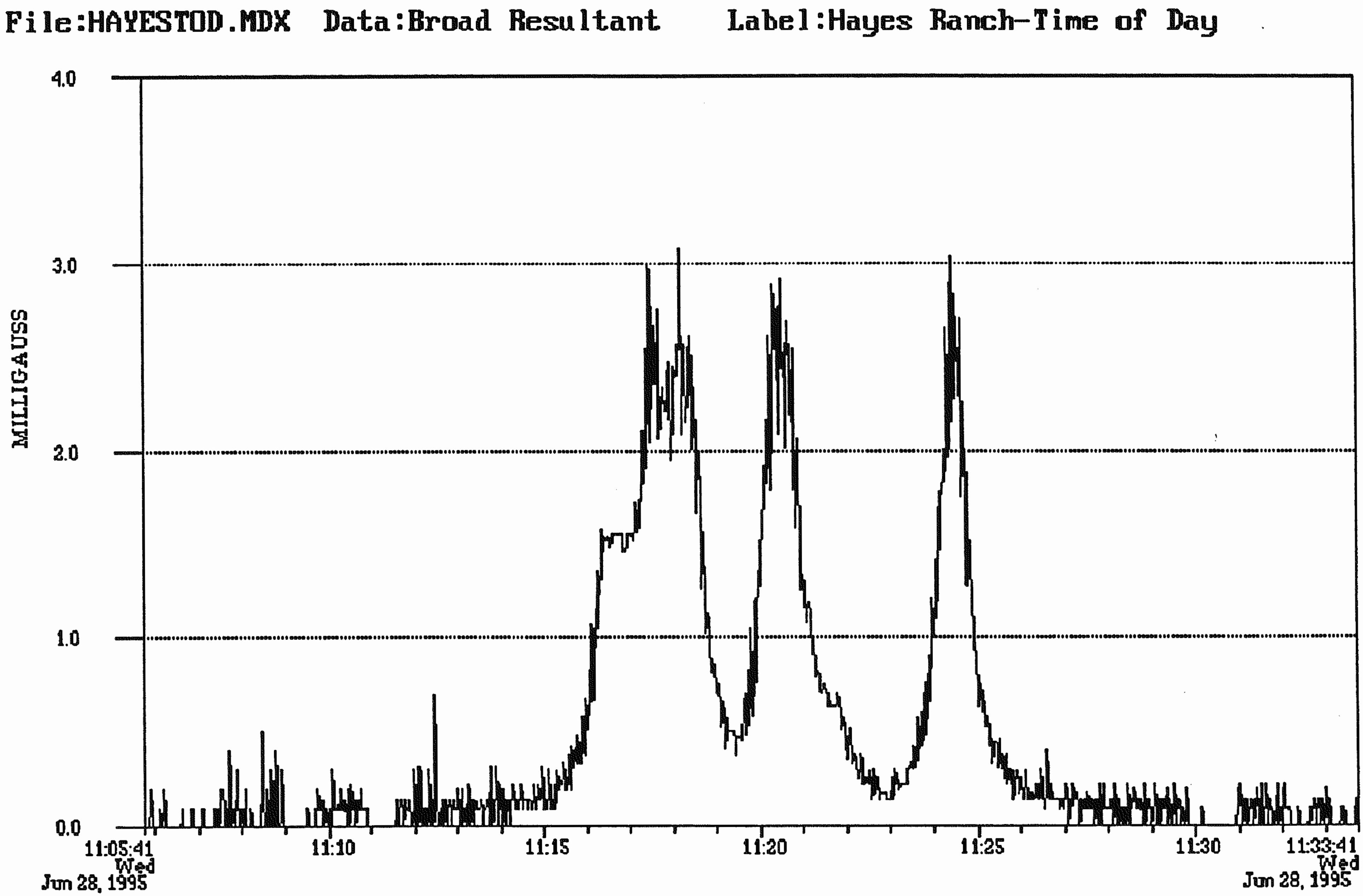

File:HAYESTOD.MDX Data:Broad Resultant Label:Hayes Ranch-Time of Day
MILLIGAUSS
4.0
3.0
2.0
1.0
0.0
11:05:41 Wed Jun 28, 1995
11:10
11:15
11:20
11:25
11:30
11:33:41 Wed Jun 28, 1995

FIGURE 6

APPENDIX M

Water Supply Reports and Documentation

GEOCONSULTANTS, INC.
Engineering Geology • Hydrogeology
Ground-Water Exploration & Development
Ground-Water Resource Management
1450 Koll Circle, Suite 114
San Jose, California 95112
Telephone: (408) 453-2541
Fax: (408) 453-2543

Project G1022-01
April 6, 1995

Mr. Tom Hix
Hayes Valley Development Partners
405 El Camino Real, Suite 127
Menlo Park, CA 94025

**RE: PRELIMINARY GROUND-WATER AVAILABILITY
PROPOSED LION'S GATE DEVELOPMENT
HAYES VALLEY
SANTA CLARA COUNTY, CALIFORNIA**

Dear Mr. Hix:

In accordance with your authorization of February 5, 1995, we have completed our preliminary ground-water availability study for the proposed Lion's Gate development. The purpose of the study was to evaluate, on a very preliminary basis, the hydrogeologic conditions in the area, with particular respect to the maximum amount of ground water that could be extracted, without causing an overdraft condition.

INTRODUCTION

The scope of work for this study involved a review of the existing published and unpublished hydrogeologic data. Water well location studies and aquifer testing were outside the scope of this preliminary study.

The location of the study area with respect to regional hydrogeologic conditions is shown on the Regional Map, Figure 1. The proposed development encompasses roughly 450 acres of the approximately 1,700-acre property, located southwest of San Martin in Santa Clara County, California. At the present time, the property consists primarily of grazing land, with ranch buildings clustered in the eastern portion near Highland Avenue. One existing ground-water well is purportedly located near the buildings, however, no information is available.

Present development plans call for the construction of one 18-hole and one 9-hole golf course, a driving range, a clubhouse, and a motel on roughly

290 acres of the valley floor. 40 residences are planned for 176 acres of the eastern portion of the site, with the remainder of the property in open space. At present, it is proposed to supply the development entirely from off-site water sources. Ground water will be used only as a supplemental source for golf course irrigation.

HYDROGEOLOGIC CONDITIONS

According to Dibblee (1973a and 1973b), the geologic units within the immediate site vicinity include alluvial materials, present along the valley floor, and bedrock materials belonging to the Franciscan Assemblage. The alluvial materials, consisting primarily of unconsolidated to semi-consolidated gravels, sands, and silts, are considered the primary aquifer in the area. These materials are less than 100 feet in thickness at the site, according to available exploratory boring logs. For the most part the permeability of these soils is moderate at 0.2 to 0.63 inches per hour (U.S. Department of Agriculture, 1968).

Franciscan Greenstone and Sandstone underlie the alluvium and comprise the hills both to the north and south of the valley floor. Ground-water wells can be located within these materials, particularly where intense fracturing has occurred, however, yields generally do not exceed 25 gpm.

The West Branch of Llagas Creek emanates from a spring in the northern portion of the property, and eventually flows through the alluvial deposits to the east. The hills to the north and south provide rainfall recharge to the alluvial ground-water basin. For the purposes of this preliminary study, roughly 100 acres in the western portion of the property was not included, since it is outside this basin. Within the alluvial valley, ground-water levels are relatively shallow, with depths generally less than 50 feet. Ground-water gradients are gentle and parallel the direction of creek flow. Ground-water recharge at the site occurs primarily from rainfall.

GROUND-WATER AVAILABILITY

Although ground water is stored in the water-bearing alluvial deposits and fractures within bedrock materials, the ultimate availability is determined by the amount of rainfall recharge on a long term basis. Ground-water extraction in an amount over the natural or artificial replenishment of the subsurface reservoir will result in mining and overdraft. Because of limited data, a normal hydrologic balance would be misleading due to the many unknowns. Therefore, as one approach to assessing the available supply, we have evaluated rainfall and runoff data in order to estimate available recharge for the site. It is important to note that a significant amount of the golf course irrigation water will also enter the ground-water basin as recharge. However, to provide a conservative estimate, this figure was not included in our analysis.

The project site encompasses roughly 1,700 acres. Rantz (1971) indicates that the average annual rainfall is 21 inches. Rantz (1974) further estimates that 4.5 inches of rainfall becomes runoff, with the remaining quantity either percolating into the ground, or being lost to evapotranspiration (ET). The non-runoff component of rainfall at the site is 16.5 inches. We estimate that roughly 80 percent of this total is lost to ET and near-surface retained moisture, with the remaining 20 percent becoming deep percolation. Therefore, about 3.3 inches of rainfall or roughly 470 ac-ft/yr will be available for recharge to the site on an average annual basis.

The surface acreage of the valley floor was measured to be roughly 330 acres, while the average saturated thickness of the alluvial materials was estimated to be approximately 50 feet. If an average specific yield of 13 percent is applied to the saturated materials, then the storage capacity of the alluvial basin is estimated to be roughly 2,150 ac-ft (area X saturated thickness X specific yield). This figure indicates a rough approximation of the absolute limit of ground water available if no recharge were to occur.

A prudent preliminary estimate of ground-water availability for the Lion's Gate development would be either one-third of the total storage capacity (717 ac-ft) or two-thirds of the annual recharge (313 ac-ft), whichever is less. Therefore, we recommend that the safe yield of the project be limited to 313 ac-ft/yr or an average of 280,000 gallons per day. Actual pumping rates may actually exceed the daily average depending on the time of year, provided that the annual safe yield is not exceeded. In addition, extended periods of heavy rainfall or drought may significantly alter the annualized averages.

LIMITATIONS

Geoconsultants, Inc. has provided its findings, recommendations, specifications, and professional advice after preparing such information in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing under similar conditions in the fields of hydrogeology. This acknowledgment is in lieu of all warranties either express or implied.

Geoconsultants, Inc. makes no guarantee of the granting of well approval, well use, and/or pumping permits by city, county, state, or other governmental authorities. No guarantee is made that water will be found in any specific quantity or mineral quality. Environmental changes, either naturally-occurring or artificially induced, may cause the quality and/or quantity of water produced to change with time. Therefore, we do not guarantee continued production or consistent mineral quality of ground water from any well in the future.

It has been a pleasure performing this preliminary evaluation for you. Should you desire a detailed basin water balance study to more accurately determine safe yield figures, or on-site studies for water well location, we will be happy to prepare a scope of work and cost estimate for that service. In the meantime, if you have any questions regarding this preliminary evaluation, please call.

Sincerely,

GEOCONSULTANTS, INC.

John K. Hofer
Engineering Geologist, EG-1065

JKH:rls
(G1022-01.doc)

SELECTED REFERENCES

California Department of Water Resources, 1981, Evaluation of ground water resources, south San Francisco Bay, Vol. IV, south Santa Clara County area: Bulletin 118-1, 143 p.

Dibblee, T.W., Jr., 1973a, Geologic map of the Gilroy quadrangle, Santa Clara County, California: U.S. Geological Survey Open File Map, scale 1:24,000.

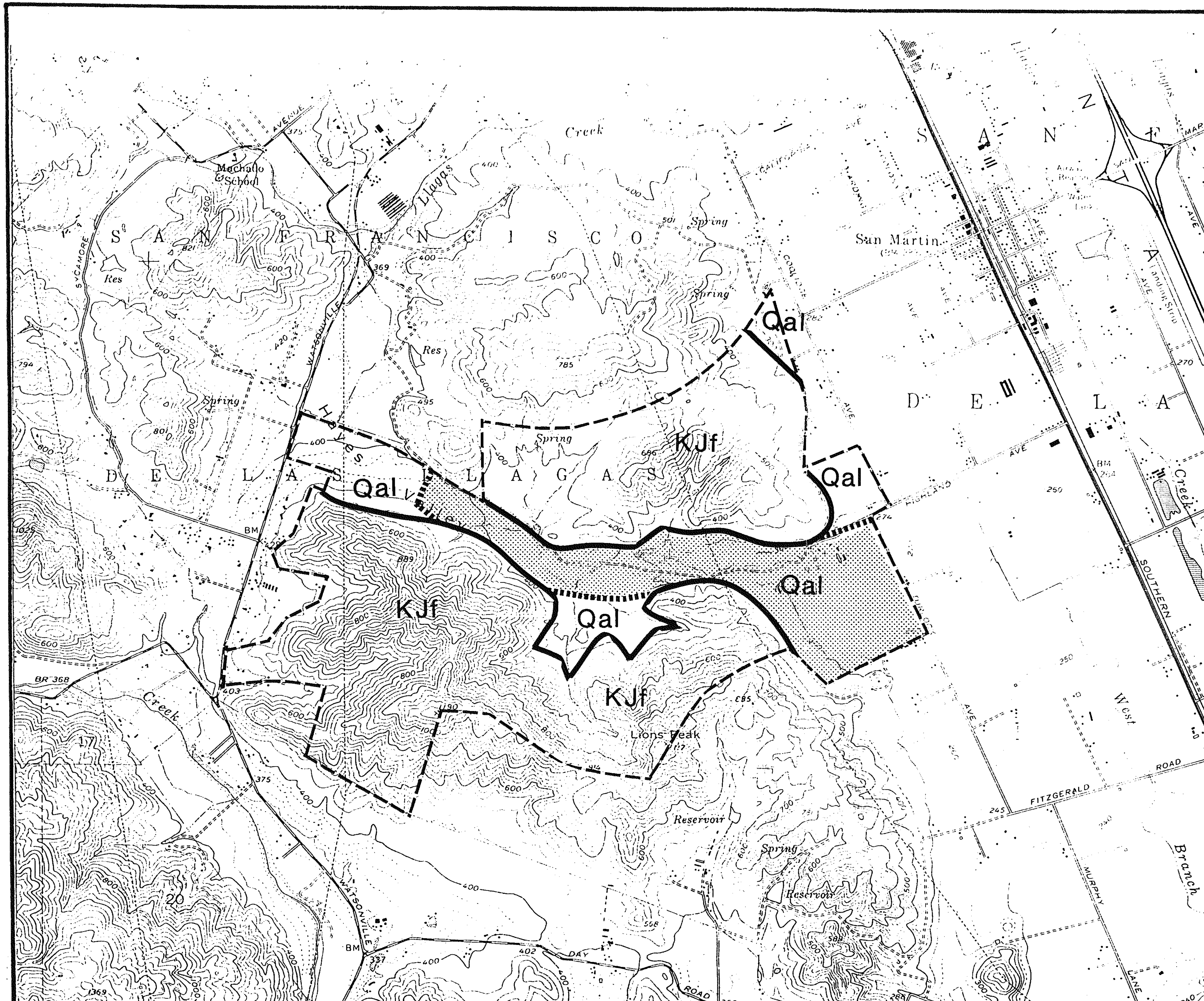
_______________, 1973b, Geologic map of the Mount Madonna quadrangle, Santa Clara and Santa Cruz Counties, California: U.S. Geological Survey Open File Map, scale 1:24,000.

Rantz, S.E., 1971, Mean annual precipitation and precipitation depth-duration-frequency data for the San Francisco Bay region, California: U.S. Geological Survey Open File Report.

__________, 1974, Mean annual runoff in the San Francisco Bay region, California, 1931 - 70: U.S. Geological Survey Miscellaneous Field Studies Map MF-613.

U.S. Department of Agriculture, 1968, Soils of Santa Clara County: Soil Conservation Service, 228 p.

Williams, J.W., Armstrong, C.F., Hart, E.W., and Rogers, T.H., 1973, Environmental geological analysis of the South County study area, Santa Clara County, California: California Division of Mines and Geology Preliminary Report 18, 41 p.



LEGEND

Qal	*Alluvium*
KJf	*Franciscan Assemblage*
(dashed line)	*Property Boundary*
(solid line)	*Lithologic Contact*
(stippled area)	*Alluvial Ground-Water Basin*

N

1000 0 2000 ft
SCALE

REGIONAL MAP

GEOCONSULTANTS, INC.
Geotechnical Consultants
Geology • Ground Water
1450 Koll Circle, Suite 114
San Jose, California 95112

G1022-01
4/95

FIGURE 1

GEOCONSULTANTS, INC.
Hydrogeology • Ground-Water Exploration & Development •
Ground-Water Resources Management •
1450 Koll Circle, Suite 114
San Jose, California 95112
Phone: (408) 453-2541 Fax: (408) 453-2543

RECEIVED
FEB 21 1996
NOLTE and ASSOCIATES
SAN JOSE

Project No. G1022-01A
February 20, 1996

Mr. Tom Hix
Hayes Valley Development Partners
405 El Camino Real, Suite 127
Menlo Park, CA 94025

**RE: PRELIMINARY WATER SUPPLY ANALYSIS
PROPOSED LION'S GATE RESERVE
SANTA CLARA COUNTY, CALIFORNIA**

Dear Mr. Hix:

In accordance with your authorization of February 9, 1996, this letter presents our preliminary water supply analysis for the proposed Lion's Gate Reserve. The analysis primarily involved the ability of the West San Martin Water Works and Twin Valley, Inc. to provide the quantities of ground water proposed in the project EIR. The purpose of the study was to prepare a conservative estimate of recharge in each of the affected basins, so as to determine if additional pumping for the Lion's Gate project would cause an overdraft condition.

As reported in the EIR, the project will require an average of 64 acre-feet per year (ac-ft/yr) for domestic usage, and an average of 374 ac-ft/yr for non-potable irrigation. It is proposed to obtain the supply from West San Martin Water Works, Twin Valley, Inc., and on-site sources. It has already been determined that the on-site supply will be limited to 313 ac-ft/yr based on our preliminary study (Geoconsultants, Inc., 1995).

West San Martin Water Works

The three wells supplying the West San Martin Water Works are located roughly one mile northeast of the site in the alluvial deposits of the South Santa Clara Valley. The district has proposed to supply the Lion's Gate Reserve with an annual average of roughly 168 acre-feet (ac-ft) which amounts to 150,000 gallons per day (gpd). The current usage averages roughly 184 ac-ft/yr (164,000 gpd).

Although ground water is stored in the water-bearing alluvial deposits and fractures within bedrock materials, the ultimate availability is determined by the amount of rainfall recharge on a long term basis. Ground-water extraction in an amount over the natural or artificial replenishment of the subsurface reservoir will result in mining and overdraft. Because of limited data, a normal hydrologic balance would be misleading due to the many unknowns. Therefore, as one approach to assessing the available supply, we have evaluated rainfall and runoff data within that portion of the watershed and valley floor directly upstream from the wells, along with ground-water inflow from the up-gradient portion of the alluvial aquifer to the north.

The watershed and valley floor encompasses roughly 670 acres. Rantz (1971) indicates that the average annual rainfall is 21 inches. Rantz (1974) further estimates that 4.5 inches of rainfall becomes runoff, with the remaining quantity either percolating into the ground, or being lost to evapotranspiration (ET). The non-runoff component of rainfall at the site is 16.5 inches. We estimate that roughly 80 percent of this total is lost to ET and near-surface retained moisture, with the remaining 20 percent becoming deep percolation. Therefore, about 3.3 inches of rainfall or roughly 184 ac-ft/yr (164,265 gpd) is available for recharge from rainfall to the wells on an average annual basis.

Ground-water inflow from the north can be determined from the following formula:

$$\mathbf{Q = k\,i\,a,}$$

where,
Q is the quantity of ground-water inflow,
k is the permeability of the subsurface materials,
i is the ground-water gradient, and
a is the cross-sectional area of the path of inflow.

A model prepared by the California Department of Water Resources (1981) indicated a transmissivity of the subsurface materials north of the wells to be 100 ac-ft/yr. This figure converts to a permeability of roughly 446 gallons per square foot per day. Ground-water gradients in the vicinity were determined to be 0.002 feet per feet. The horizontal distance across the path of inflow was measured as 4,500 feet, and an average thickness of saturated materials was estimated to be 200 feet. Therefore, the cross-sectional area was calculated to be 900,000 square feet. By using the above equation, the ground-water inflow was calculated to be roughly 899 ac-ft/yr.

Q = (446 gallons per sq ft per day) X (0.002 feet per feet) X (900,000 sq ft)

Q = 802,800 gpd(899 ac-ft/yr)

By combining the rainfall and inflow components of recharge, a total of 1,083 ac-ft/yr (967,065 gpd) is available for recharge. If a two-thirds factor is applied to this figure, then roughly 722 ac-ft/yr or 645,000 gpd is a prudent estimate of safe yield. At present, the West San Martin Water Works supplies roughly 184 ac-ft/yr (164,000 gpd) to its customers, leaving roughly 538 ac-ft/yr available for increased usage. The projected increase in usage of 168 ac-ft/yr (150,000 gpd) for the Lion's Gate Reserve will only amount to roughly 31 percent of this figure, which should not cause adverse effects on the aquifer.

Twin Valley Inc.

Two wells, located roughly one-half mile southwest of the site, have been supplying Twin Valley, Inc. customers prior to this year. Due to unacceptable nitrate levels in the water, these wells have now been taken out of service for domestic usage, and a new well has been constructed as a replacement. It has been proposed to utilize the two high-nitrate wells to supply irrigation water for Lion's Gate. At present, average pumping for Twin Valley, Inc. is roughly 107 ac-ft/yr (96,000 gpd).

That portion of the watershed up-gradient of the two wells in question encompasses roughly 570 acres. Rantz (1971) indicates that the average annual rainfall is 26 inches. Rantz (1974) further estimates that 6.5 inches of rainfall becomes runoff, with the remaining quantity either percolating into the ground, or being lost to evapotranspiration (ET). The non-runoff component of rainfall at the site is 19.5 inches. As we have estimated in the other analyses, roughly 80 percent of this total is lost to ET and near-surface retained moisture, with the remaining 20 percent becoming deep percolation. Therefore, about 3.9 inches of rainfall or roughly 185 ac-ft/yr (165,158 gpd) is available for recharge from rainfall to the site on an average annual basis.

If a two-thirds factor is applied to this figure, then roughly 123 ac-ft/yr or 110,000 gpd is a prudent estimate of safe yield. As stated above, Twin Valley, Inc. currently supplies roughly 107 ac-ft/yr (96,000 gpd) to its customers, leaving only 16 ac-ft/yr (14,000 gpd) available for increased usage.

Lion's Gate Reserve

Questions have been raised regarding the impact of the projected usage of on-site wells for irrigation supplies on existing off-site wells immediately down-gradient to the east. Provided that on-site irrigation supply wells are located a prudent distance from the eastern property line, the impact on down-gradient wells should be minimal.

Conclusions

According to the EIR, the total average daily demand for the Lion's Gate Reserve is roughly 391,000 gallons. It is proposed to obtain water supplies from a combination of on-site sources, and imported water from West San Martin Water Works and Twin Valley, Inc. Our previous study (Geoconsultants, Inc., 1995) determined that 280,000 gpd could be developed on site. That combined with 150,000 gpd from West San Martin, and 14,000 gpd from Twin Valley, amounts to a total available supply of 444,000 gpd, which creates an average surplus of 53,000 gpd.

It should be noted that these figures are preliminary in nature. In order to assure that the projected supplies are realistic, a detailed aquifer analysis will need to be performed at the Lion's Gate Reserve. In addition, it may be necessary to perform further studies in the West San Martin and Twin Valley areas.

LIMITATIONS

Geoconsultants, Inc. has provided its findings, recommendations, specifications, and professional advice after preparing such information in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing under similar conditions in the fields of hydrogeology. This acknowledgment is in lieu of all warranties either express or implied.

It has been a pleasure performing this service for you. If you have any questions, please call.

Sincerely,

GEOCONSULTANTS, INC.

John K. Hofer
Engineering Geologist, EG-1065

JKH:rls
(G1022-01A.doc)

SELECTED REFERENCES

California Department of Water Resources, 1981, Evaluation of ground water resources, south San Francisco Bay, Vol. IV, south Santa Clara County area: Bulletin 118-1, 143 p.

Dibblee, T.W., Jr., 1973a, Geologic map of the Gilroy quadrangle, Santa Clara County, California: U.S. Geological Survey Open File Map, scale 1:24,000.

______________**, 1973b,** Geologic map of the Mount Madonna quadrangle, Santa Clara and Santa Cruz Counties, California: U.S. Geological Survey Open File Map, scale 1:24,000.

Geoconsultants, Inc., 1995, Preliminary ground-water availability, proposed Lion's Gate Development, Hayes Valley, Santa Clara County, California: for Hayes Valley Development Partners, 6 p.

Rantz, S.E., 1971, Mean annual precipitation and precipitation depth-duration-frequency data for the San Francisco Bay region, California: U.S. Geological Survey Open File Report.

_________**, 1974,** Mean annual runoff in the San Francisco Bay region, California, 1931 - 70: U.S. Geological Survey Miscellaneous Field Studies Map MF-613.

Williams, J.W., Armstrong, C.F., Hart, E.W., and Rogers, T.H., 1973, Environmental geological analysis of the South County study area, Santa Clara County, California: California Division of Mines and Geology Preliminary Report 18, 41 p.

WEST SAN MARTIN WATER WORKS, INC.

1005 HIGHLAND AVE. • SAN MARTIN, CALIFORNIA 95046 • 408-683-2098

November 30, 1995

Mr. Thomas Hix
Hayes Valley Development Partners
405 El Camino Real
Menlo Park, CA 94025

Dear Mr. Hix:

In response to your request for information about the water distribution capabilities of West San Martin Water Works, Inc., I would like to share with you the following:

West San Martin Water Works, Inc. currently serves aproximately 180 customers in the San Martin area. The average gallons pumped each year is 60 million gallons (MG) with 15 MG sold to the San Martin County Water District. We currently have wells located at the corner of Chester and Sewell, on Colony between San Martin and Cox Avenues, and at Monterey Road and Highland Avenue with a total output of 1000 GPM. All three wells are approximately 400 feet deep and have excellent water quality. Our storage capacity consists of three 50,000 gallon tanks located west of San Martin with the lower tank (Tank 1) being at an elevation of 456.5 feet.

We are currently in the process of applying for a permit with the county to increase our storage capacity by an additional 300,000 gallons. This above ground tank will be located on West San Martin Avenue in the Hayes Ranch subdivision immediately adjacent to Tank 1 within the same property easement, and at the same elevation. This improvement will greatly enhance our ability to provide sufficient domestic water and fire protection for our existing customers and projected future growth.

In addition to the new water tank, we are currently engineering plans to install a 10 inch main on Highland Avenue and an 8 inch line to connect to our new water tank. This will also prevent any low pressure problems in some of our service area and increase fire protection capability.

In closing, having reviewed your proposed development plans for the Lion's Gate project, we are confident that with the added capacity West San Martin Water Works, Inc. will be able to handle all of your potable water and fire protection requirements. We can provide you with a daily average potable water/fire protection volume of 150,000 gallons per day, or the peak project demand of 300,000 gallons per day.

Thus, please consider this letter as a confirmation letter that this utility, West San Martin Water Works, Inc. is willing and able to serve your project needs.

We look forward to working with you as your project progresses through the approval process. Please do not hesitate to call me if you have any questions.

Sincerely,

Bob Ukestad

Bob Ukestad, Manager
West San Martin Water Works, Inc.

APPENDIX N

Wastewater Feasibility Study

Prepared by

Questa Engineering

December 1995

WASTEWATER FEASIBILITY STUDY

FOR

LION'S GATE RESERVE

SANTA CLARA COUNTY, CALIFORNIA

Prepared For

Hayes Valley Development Partners

Prepared By

Questa Engineering Corporation
1220 Brickyard Cove Road, Suite 206
Point Richmond, CA 94808

December 1995

WASTEWATER FEASIBILITY STUDY

FOR

LION'S GATE RESERVE

SANTA CLARA COUNTY, CALIFORNIA

Prepared For

Hayes Valley Development Partners

Project 95142

Prepared By

Questa Engineering Corporation
1220 Brickyard Cove Road, Suite 206
Point Richmond, CA 94808
(510) 236-6114

REGISTERED PROFESSIONAL ENGINEER
NORMAN N. HANTZSCHE
12/12/95
No. C24750
CIVIL
STATE OF CALIFORNIA
EXP. 12/31/97

December 1995

TABLE OF CONTENTS

INTRODUCTION

This report represents the background data, analysis and description of recommended wastewater facilities to serve the proposed Lion's Gate Reserve in Santa Clara County. The project site encompasses 1,676 acres, located on the former Hayes Valley Ranch, immediately southwest of the City of Morgan Hill. The project consists of an 18-hole golf course, clubhouse facilities, and overnight lodging units and 41 individual residential lots with associated swimming, tennis and equestrian facilities.

This document is intended to serve as a wastewater feasibility analysis for use in final project planning, review by the County of Santa Clara and the Central Coast Regional Water Quality Control Board (Regional Water Board), and as a basis for ultimate wastewater system design. The report includes:

- estimates of projected wastewater flows and the supporting rationale;
- outline of pertinent regulatory requirements for wastewater treatment and disposal;
- description and map of proposed wastewater facilities;
- requirements and recommendations for management and operation of the proposed facilities;
- review of key environmental concerns associated with the proposed wastewater facilities including an analysis of nitrate loading impacts; and,
- a review of alternative wastewater treatment and disposal options considered for the project.

In the feasibility analysis and in formulating the recommended plan for wastewater facilities described in this report, high priority was given to achieving compliance with all applicable public health and water quality criteria, minimizing potentially objectionable aspects of the wastewater facilities from the standpoint of residents, neighbors and the visiting public, and maximizing potential opportunities for water reuse. As part of the evaluation process, discussions were held with the staff of the Santa Clara County Health Department and the Regional Water Board to clarify the anticipated requirements and to focus the review and analysis of wastewater alternatives. Additionally, field inspection and review of other available site data were conducted to provide a sufficient characterization of site conditions as needed for this feasibility analysis.

SUMMARY

The recommended wastewater facilities plan for Lion's Gate Development presented in this report includes the following key elements:

- Central collection, treatment and disposal system for the golf course facilities and all of the residential development;

- Septic Tank Effluent Pump (STEP) collection system, utilizing on-lot septic tanks and pumps, as required, at individual residences and for the golf course clubhouse and lodging units and small diameter PVC piping for conveyance of flows to the central treatment plant;

- Secondary treatment plant located adjacent to the golf course practice range, and providing a final effluent quality that meets applicable treatment standards for wastewater reclamation contained in the California Administration Code, Title 22;

- Wet weather storage of treated wastewater in an 8-acre-ft capacity holding pond located upslope and immediately northwest of the golf course practice range.

- Final effluent disposal by means of spray irrigation of approximately 12 acres of turf grass and open space at the golf course driving range and chipping area, and surrounding grassland areas.

- Operation and maintenance of the wastewater facilities to be under the authority of a public entity, such as a community services district or sanitation district to be formed specifically for this purpose.

PROJECT SITE DESCRIPTION

The project site consists of approximately 1,600 acres of rolling hills (1,200 acres) and valley floor (400 acres) in the watershed area tributary to Llagas Creek. The site is about 11 miles south of the City of San Jose, two miles west of State Highway 101 and northeast of the base of Lion's Peak. Elevations range from about 1,200 feet in the southern portion of the site (Lion's Peak) to 270 feet in the valley floor.

The site is estimated to receive average annual rainfall of about 21 inches, occurring mainly between the months of November through April. Runoff concentrates in the West Branch of Llagas Creek which generally flows across the project from west to east, ultimately leaving the site, crossing Santa Teresa Boulevard and entering the main stem of Llagas Creek some distance to the south of the project site.

The geology of the site is dominated by the Franciscan formation, which includes a mixture of sandstone, shale, chert, and other sedimentary rocks. The other key geologic feature is the broad alluvial valley in the eastern portion, formed largely form the erosion and deposition of sediments and rocks from the surrounding hills.

The site is included in the U.S.D.A. Soil Conservation Services's (SCS) Soil Survey of Eastern Santa Clara Area (1974). The four principal soil series mapped in the eastern and valley floor portions of the site are: Keefers clay loam (KeC2), Los Robles clay loam (LrA), Cropley clay (CrA) and Maxwell clay (McB). These soils occur on alluvial fans. They are deep, well-drained soils and have slow to moderately slow permeability. The main constraint for sub-surface sewage disposal associated with these soils is the slow to moderately slow permeability. But, all of these soils are considered suitable for irrigated crops and pasture.

The western upland portion of the site has been mapped as Gilroy clay loam (GoF, GoD, GoG and GoE2). These hillslopes vary from gentle 5% slopes to very steep slopes (50 - 75%) with about 1 ½ feet to 3 feet of clay loam soil cover over metamorphosed basic igneous rock. Gilroy soils are rated as being well drained with moderately slow permeability. These loamy soils are used for pasture, hay, vineyards and rangeland. The area of the site proposed for spray irrigation with reclaimed wastewater is predominated by the Gilroy and Los Robles soil series.

Preliminary studies have been conducted on the project site to determine groundwater conditions for location of individual septic systems. These studies, completed in the spring of 1995 by Pacific Geotechnical, identified substantial area in the eastern portions of the site with seasonal groundwater at depths of greater than 10 to 15-feet below ground surface. These areas coincide with the proposed building sites for individual residences. Many other areas of the project site are known to have elevated seasonal water tables that would restrict their use for sub-surface sewage disposal systems.

PROJECTED WASTEWATER FLOWS

Lion's Gate Reserve project will include 41 custom residential lots, an 18-hole golf course and clubhouse, 45 overnight lodging units at the golf course, a swim and tennis center, and an equestrian center. All facilities, except the golf course maintenance building, are planned to be served by a central wastewater collection, treatment and disposal system. Because of its remote location and relatively small sewage flows, the maintenance building will be served by an individual septic tank - leachfield system. Estimates of average and peak wastewater flows are necessary for planning and ultimately designing the wastewater facilities. Summarized in **Table 1** are estimates of the projected wastewater flows. Provided below is a discussion of the supporting rationale for these estimates. These estimates are suitable for the present planning and feasibility analysis, and for use in the environmental assessment of the project in compliance with the California Environmental Quality Act. Further refinement of the flow projections may be required at the time of final system design.

Single-Family Residential Units

The project includes 41 new, custom residential lots. For central wastewater facilities, average flows from single-family residential units are typically estimated to be in the range of about 200 to 250 gallons per day (gpd) per connection. The actual flows will vary depending upon the size, occupancy and character of the residences, and the degree to which water conserving plumbing devices and practices are incorporated in the homes. The recent laws in California requiring low-flow plumbing devices (e.g., 1.6-gallon flush toilets) in new construction have had a measurable effect on wastewater flows; typical flows from residential areas now tend to average less than 200 gpd/house.

TABLE 1

ESTIMATED WASTEWATER FLOWS*

Activity	Number of Units	Daily Unit Flow	Total (gpd)
Residences	41 houses	250 gpd	10,250
Equestrian Facility	25 visitors 1 caretaker	10 gpd 150 gpd	250 150
Swim & Tennis Center	50 visitors	10 gpd	500
Golf Course Clubhouse • Employees • Golfers (Restroom) • Showers (10%) • Restaurant	 30 200 20 200 meals	 15 gpd 5 gpd 25 gpd 10 gal/meal	 450 1,000 500 2,000
Driving Range	50 visitors	3 gpd	150
Overnight Lodging	45 rooms	150 gpd	6,750
Subtotal	-	-	22,000
Contingency	-	-	1,000
TOTAL	-	-	**23,000**

* Note: This does include the wastewater flows for the golf course maintenance building (approximately 300 gpd) which will be served by an individual septic system.

To be conservative in planning wastewater facilities for the proposed project, an average daily unit flow estimate of 250 gpd/residence is assumed; this would adequately account for wastewater from a four to five bedroom (or more) residence on each parcel. On this basis, the total estimated flow contribution from the proposed 41 single-family residences would be 10,250 gpd (average dry weather flow).

Equestrian Facility

The equestrian facility will have restrooms for employees and visitors, plus a small caretaker's residence. The wastewater flows from the equestrian facility are estimated to be approximately 400 gpd, based on 25 visitors/employees per day and a unit flow of 10 gpd/person, and 150 gpd for the caretaker's residence.

Swim and Tennis Center

This swim and tennis center will be available for use by residents and their guests. The facility will have restrooms, showers and, perhaps, a small kitchen. Use of these facilities would be greatest in the summer and on weekends, and smallest in the winter and during the week; accordingly, daily wastewater flows will fluctuate greatly. For planning purposes, the average daily flow is estimated to be 500 gpd, based on 50 visitors/employees per day and a unit flow of 10 gpd/person (U.S. EPA, 1980).

Golf Course Clubhouse

Wastewater flows for the golf course clubhouse include: (a) restroom usage by employees (@ 15 gpd/person) and visitors (@ 5 gpd/person); (b) shower usage by a portion (10%) of the golfers (@ 25 gal/shower); and, (c) restaurant/food preparation (@ 10 gal/meal).

Driving Range

The driving range will be open to the public and will have a restroom separate from the golf course clubhouse. Based on approximately 50 visitors per day, and three (3) gallons per person, the estimated wastewater flow from the driving range would be about 150 gpd.

Overnight Lodging

Overnight lodging at the golf course is estimated on the basis of 150 gpd/unit, which includes allowance for cleaning and on-site laundry.

Total Wastewater Design Flow

Based on the above information, the total wastewater flow for the Lion's Gate project is estimated to be approximately 23,000 gpd; this includes a contingency of approximately 1,000 gpd to account for uncertainties about the specific details of project facilities that cannot be known until the design stage. This flow estimate represents the projected average daily flow upon which to base the treatment plant, storage pond and disposal facilities design; it is also an appropriate estimate to use for the wastewater/nitrate loading assessment presented later in this report.

Infiltration and Inflow

Wastewater flows must also account for infiltration and inflow (I/I) into the sewage collection system during the wet season; and this can vary widely depending upon the type, size and length of sewer lines, the materials and workmanship of the sewer installation, and the local groundwater and drainage conditions. Infiltration and inflow is typically highest in low lying, high rainfall areas where conventional gravity sewers are used. The proposed project intends to utilize small diameter effluent sewers, which have gasketed or glued watertight joints, and very little chance for extraneous (I/I) water to enter the sewer lines. The only areas potentially vulnerable to I/I would be the septic tanks and pump chambers at the individual residences and the golf course clubhouse and lodging facilities. If the tanks are properly located and installed to avoid cracks and leakage, the collection system should be free of any I/I. Design practice for effluent sewers normally excludes the I/I component because of the watertight connections in the system. Although portions of the project site are seasonally wet, the residential areas where the collection system will be installed are generally dry and well-drained, as documented through groundwater testing. Therefore, it is reasonable and appropriate to follow the standard design approach for STEP systems and consider I/I contributions to be negligible.

Peak Flow Considerations

Final wastewater facility design would also need to anticipate and provide for peak flow conditions which, on a daily basis, may be in the order of 25 to 30 percent higher than the average daily flow. For the proposed project this translates to a peak system flow estimate of about 30,000 gpd.

Collection System Design

Design of the recommended STEP collection system will require estimates of flow from the individual properties served. The average daily flow figures presented here would be adequate for pipeline design. However, the sizing of individual on-lot septic tanks and associated pumping units (if necessary) are typically designed on the basis of maximum expected flow from the particular building or residence. The design would be expected to follow Santa Clara County sewage disposal regulations which specify septic tank size according to the number of bedrooms in the house (for single-family residences) and the maximum anticipated daily wastewater flow (for commercial and multi-family residential buildings). The appropriate calculation for individual system components would be completed at the time of final engineering design for each building.

WASTEWATER TREATMENT AND DISPOSAL REQUIREMENTS

Wastewater treatment and disposal in the eastern portion of Santa Clara County where the project is located are governed by a variety of policies and regulations established by the Central Coast Regional Water Quality Control Board (Regional Water Board) and the Santa Clara County Health Department. Most of the pertinent requirements affecting the proposed wastewater facilities for the Lion's Gate project are contained in the following:

- Water Quality Control Plan for the Central Coast Region (Central Coast Regional Water Quality Control Board);
- Title 22, Division 4, California Administrative Code - Wastewater Reclamation Criteria (including pending revisions); and,
- Articles 1 and 2, Chapter II of the Santa Clara County Code.

The requirements pertaining to the various elements of the wastewater system are briefly described below.

Treatment Facilities

- **On-lot Septic Tanks.** For the proposed project, on-lot septic tanks will provide the primary treatment function. The sizing of septic tanks for residential and commercial buildings is set forth in Santa Clara County Code. For single-family residential systems the minimum septic tank size is 1,500 gallons; this may be increased by an additional 500 gallons for exceptionally large houses (e.g., five or six bedrooms). For commercial facilities, such as the golf course clubhouse and lodging, septic tank size is based upon the estimated maximum daily wastewater flow, to achieve roughly two days of detention time in the septic tank. Accordingly, tank sizes of 10,000 to 15,000 gallons would be required for the clubhouse and lodging facilities.

  In addition to the septic tank, a grease interceptor would also be required for the waste stream from the restaurant kitchen facilities at the golf course clubhouse. This is normally sized according to the restaurant size or the number of meals served. A grease interceptor in the range of 5,000 to 7,500 gallon capacity would be anticipated for the golf clubhouse.

- **Central Treatment Plant.** Requirements for centralized treatment facilities in Santa Clara County are established principally by the Regional Water Board with provision for additional conditions that may be imposed by the Santa Clara County Health Department. The requirements are formalized as permit conditions in what are termed "Waste Discharge Requirements", issued by the Regional Water Board for the individual facility. The requirements typically specify final effluent quality and mass pollutant loadings, based upon the ultimate method and location for disposal. Treatment requirements for wastewater reclamation uses are specified in Title 22 (California Administrative Code) and are typically incorporated by the Regional Water Board as permit conditions. The Title 22 Wastewater Reclamation Criteria are presently in the process of being amended. At a minimum, use of wastewater for crop and landscape irrigation requires that the effluent be adequately oxidized, clarified, and disinfected or be treated by an equivalent sequence of unit processes; this constitutes secondary treatment and is suitable for irrigation areas considered to have restricted access and limited chances of human contact. Where access and irrigation operations are unrestricted, such as a playground or day-time golf course irrigation, the effluent must be treated to tertiary level standards, which includes the addition of coagulation and filtration processes to assure a higher level of virus removal. **Table 2** lists the Title 22 treatment standards for different reclamation uses, including the pending changes.

Wastewater Storage

For the proposed facilities wastewater storage capability is needed for two purposes:

- **Short-Term Emergency Storage.** State Wastewater Reclamation Criteria (Title 22) require provision for emergency storage. This is a contingency feature needed for the eventuality of malfunction(s) in the treatment process. Short-term emergency storage is normally provided by a small holding pond or tanks. Title 22 requires a minimum short-term storage capacity equivalent to 24 hours (one day) of sewage flow. Short-term emergency storage is also provided at all pump stations in the collection system as a matter of proper engineering design. This normally amounts to about ½ to one day of storage capacity; but there are no specific County Code or Regional Water Board requirements that pertain to this aspect of collection system design. It is normally reviewed and considered on a case-by-case basis at the time of system design.

- **Long-Term Storage**. Long-term storage (or an alternate form of discharge) is also required at wastewater reclamation facilities. Long-term storage is needed for containment of treated wastewater during wet weather periods or other times when irrigation is not needed or possible. This storage may be provided by ponds and reservoirs or by alternate disposal methods, including percolation systems. Title 22 requires a minimum of 20 days long-term storage; but this is normally increased to 90-days in areas subject to wet winters where saturated soils and/or runoff in the spray area is likely to occur for extended periods of time.

Disposal

Requirements for wastewater spray disposal are primarily set by the Regional Water Board, with input from the Health Department.

Spray disposal facilities are permitted based upon evidence of adequate terrain, soils and groundwater conditions that assure absorption of the applied effluent by the soil and plants. Unlike septic tank-leachfields, there are no specific soil depth or percolation standards that apply to spray disposal; this is because the spray disposal operations are confined to the irrigation

TABLE 2

WASTEWATER TREATMENT AND QUALITY CRITERIA FOR IRRIGATION

Treatment Level	Coliform Limits	Type of Use
SECONDARY Oxidation and Disinfection	N/A	• Surface irrigation of orchards and vineyards • Fodder, fiber and seed crops
	≤ 23/100 ml	• Pasture for milking animals • Landscape impoundments • Landscape irrigation (restricted access, golf courses, cemeteries, etc.)
	≤ 2.2/100 ml	• Surface irrigation of food crops (no contact between water and edible portion of crop)
TERTIARY Oxidation, coagulation,[1] clarification, filtration[2], and disinfection	≤ 2.2/100 ml maximum = 23/100 ml	• Spray irrigation of food crops • Landscape irrigation at parks, playgrounds, school yards, and private properties • Non-restricted recreational impoundments

1 Coagulation optional provided turbidity of filtered influent is <5 NTU.

2 The turbidity of filtered effluent cannot exceed: (a) an average of 2 NTU during any 24-hour period; (b) 5 NTU more than 5 percent of the time; and, (c) 10 NTU at any time.

season when essentially all of the wastewater would be absorb and utilized by the vegetation. Normally, spray irrigation of reclaimed water is confined to areas having slopes of 15 percent or less. Setbacks of 10 to 25 feet from property lines are common, although such setbacks can be varied on a case-by-case basis. Setbacks of 50 to 100 feet from streams and wells are also typically required; this is based on the level of treatment provided, along with the nature and uses of the streams and wells in question. The pending changes to Title 22 Wastewater Reclamation Criteria specify a 50-foot and 100-foot setback between water supply wells and areas irrigated, respectively, with tertiary treated effluent and secondary treated effluent. Additionally, the spray field must be on property controlled by the owners/operators of the wastewater facility (i.e., the discharger); this may be satisfied with long-term contract agreements.

Facility Operation and Maintenance

A community wastewater system, as proposed for the project, will be required to be owned and operated by a public agency, such as a community services district (CSD), county service area (CSA), or special district. The public agency would be the responsible party (i.e., "discharger") named in the Waste Discharge Requirements issued by the Regional Water Board for the facility. Actual day-to-day operations could be performed by employees of the District or by contractors. However, the District would have ultimate responsibility for compliance with the Waste Discharge Requirements and the filing of monitoring reports.

To establish a CSD, CSA or other special district, either the property owner(s) or the County must make an application to the Local Agency Formation Commission (LAFCO) after County approval of the project. LAFCO will consider the proposed budget, management and geographic boundaries of the proposed district in making decision to approve or deny the request. If LAFCO approves the district, then state law requires LAFCO to send the approval to the affected local jurisdiction (i.e., the County) to conduct a public hearing on establishing the district. If approved, the County would adopt a resolution stating the responsibilities of the district and specify how it would be funded. The operation of districts are financed by assessing the participating property owners through their property tax bill. This hearing is also an opportunity for affected citizens to protest the creation of the district. State law prescribes methods whereby registered voters and/or property owners within the proposed district boundaries can protest the establishment of a district. The operation costs and revenues are established at separate hearings and are reviewed and adjusted annually. The establishment of a public authority for facility ownership and operation would assure the ability to assess and collect necessary funds for on-going system maintenance and operation; these would be secured against the individual residential and commercial properties in the district.

With respect to day-to-day operations, Title 22 contains specific requirements for monitoring, record keeping and treatment plant maintenance to assure public health protection. A certified wastewater treatment plant operator would be required for the treatment plant. Additionally, for any alternative wastewater treatment/disposal system, Santa Clara County Code requires:

- one year of monitoring by the designer; and,

- a maintenance contract (between the owner and a sanitary engineering firm) for the first five years of system operation.

PROPOSED WASTEWATER FACILITIES

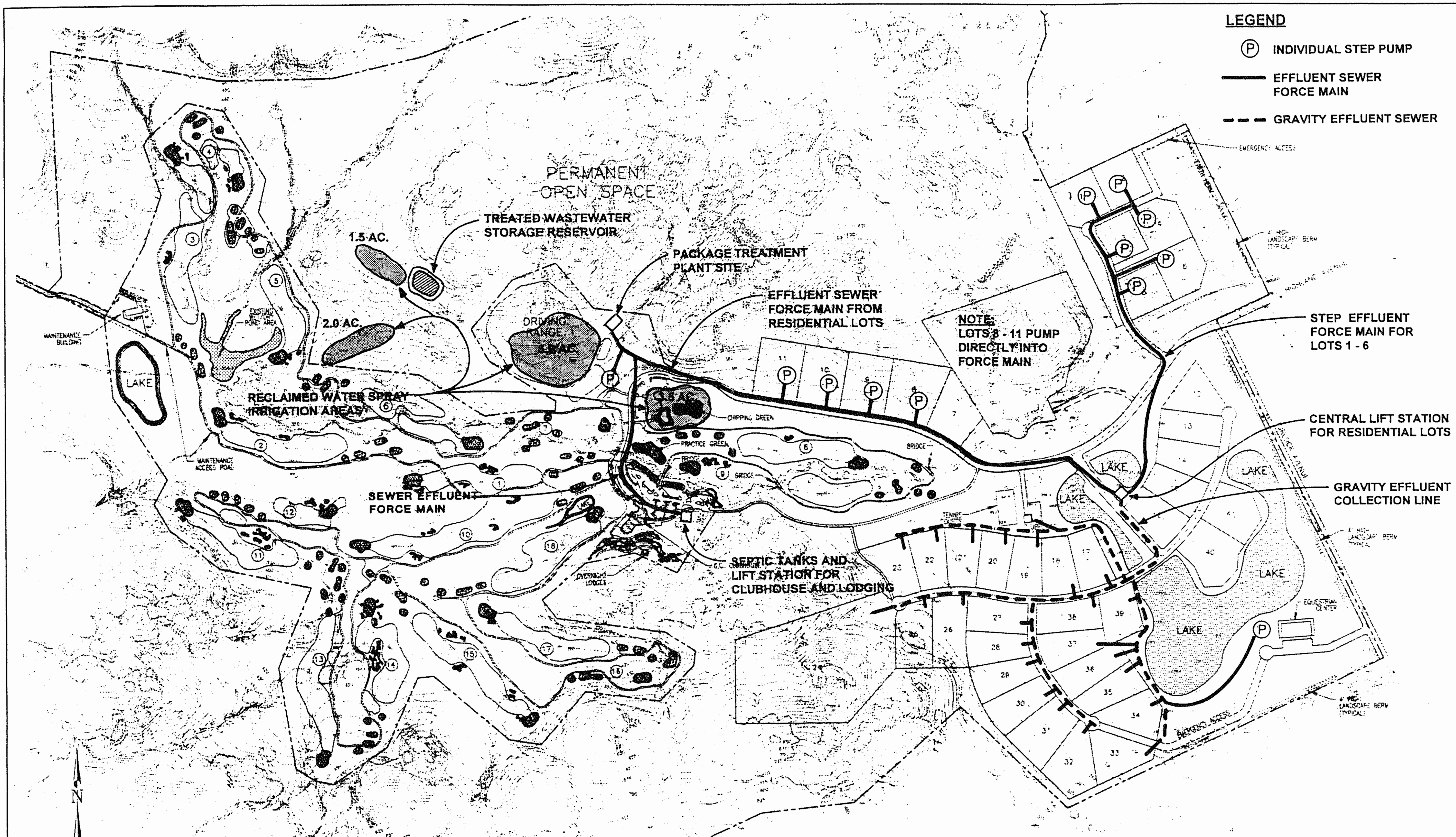
After reviewing the sewerage needs for the proposed development, applicable public health and water quality standards, and site opportunities and constraints, several potentially feasible wastewater treatment and disposal options were formulated and evaluated for the Lion's Gate project. In analyzing and comparing the available options, high priority was given to achieving compliance with all applicable health and water quality criteria, minimizing potentially objectionable physical aspects of the wastewater facilities from the standpoint of residents, neighbors and the visiting public, and maximizing opportunities for water reuse. Based on these factors, as well as standard consideration of engineering feasibility and costs, a recommended facilities plan was developed and is described in this section. The several other alternatives and variations that were considered are reviewed briefly in the last section of this report.

The basic wastewater facilities for the Lion's Gate project will consist of: (1) a STEP collection system; (2) a central enclosed treatment plant, located adjacent to the north side of the golf practice range, providing secondary level reclaimed effluent quality; (2) wet-weather storage of treated effluent by means of a lined reservoir located upslope and immediately northwest of the practice range; and, (3) final effluent disposal by means of spray irrigation of the practice range and other nearby turf grass and open-space areas. A map showing the portions of the project site covering the treatment, storage, and disposal facilities is provided in **Figure 1.**

Collection System

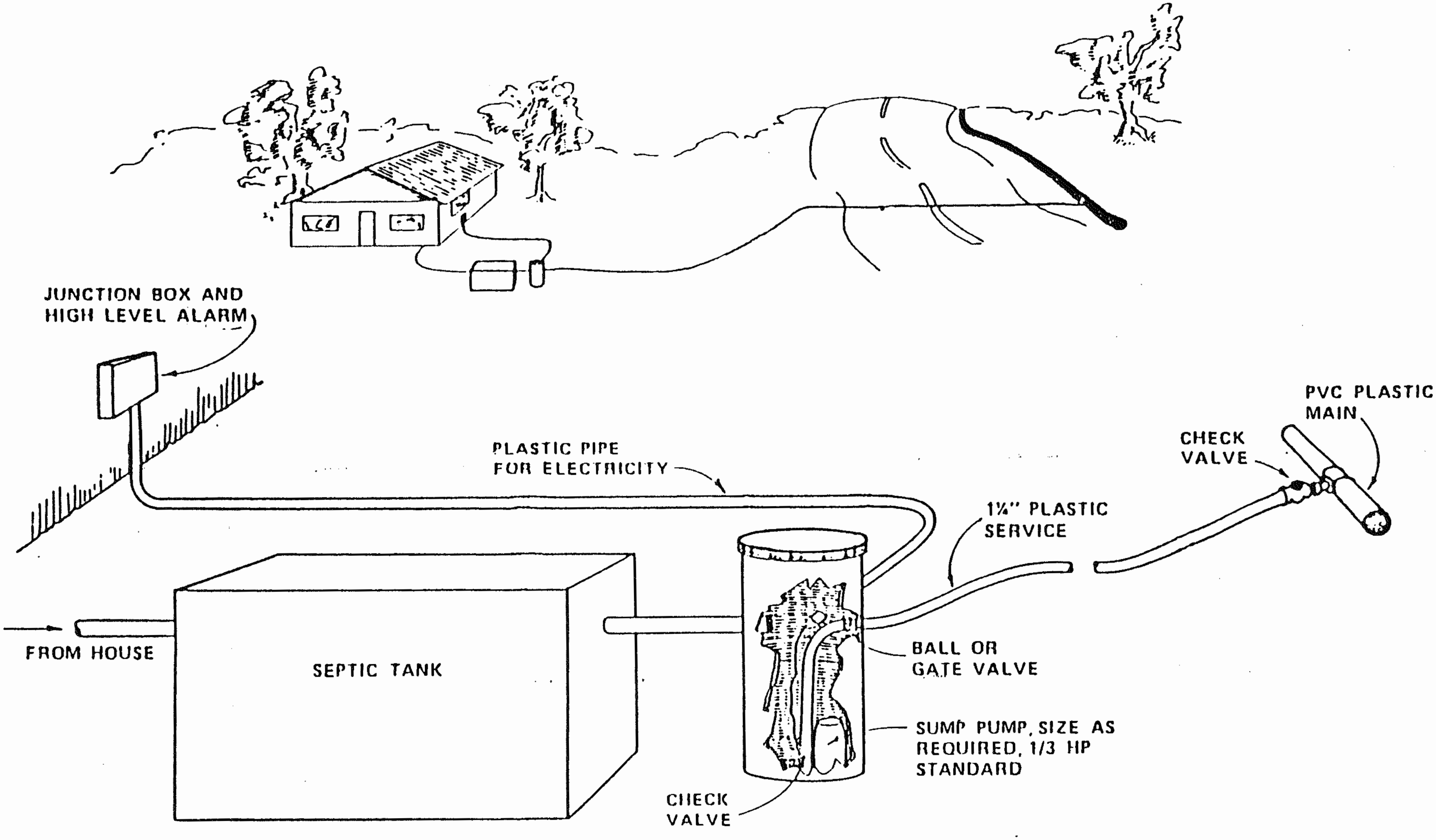
Because of the dispersed development pattern, a septic tank effluent pump (STEP) collection system is proposed. The STEP system is an alternative sewer system that emerged in the 1970s and gained much wider application and popularity during the 1980s for rural and small community wastewater systems throughout the United States. Examples of STEP collection systems in Northern California include: (1) Manila Community Services District (Humboldt County); (2) West Bay Sanitary District (Portola Valley, San Mateo County); (3) Lake Canyon Community Services District (Santa Clara County, under construction); and (4) Calaveras County Water District (Westpoint, Calaveras County).

The basic components of the STEP system are diagramed in **Figure 2.** Each house or building is provided with a septic tank where primary effluent treatment (i.e., sedimentation) occurs. The effluent from the tank is then routed to the main collection system, which is comprised of a network of small diameter plastic pipes. The flow from the septic tank to the collection system is generally by gravity. Where this is not possible, a pump chamber with a submersible effluent pump follows the septic tank and serves to pump effluent into the collection system. Check valves prevent the backflow from the collection lines into individual pumping units. For the Lion's Gate project there will be both gravity flow and pump systems. Also, there may be



SCALE: 1"=550'

Questa Engineering Corporation Point Richmond, California	LION'S GATE PROJECT PROPOSED WASTEWATER FACILITIES	Figure 1



Questa Engineering Corporation Point Richmond, Calif.	SCHEMATIC DIAGRAM OF STEP COLLECTION SYSTEM	Fig. 2

instances where the flow from one or more houses will be collected at a single common pump station.

The general layout of the STEP collection system is proposed to follow the road network as closely as possible. This will facilitate construction and system maintenance, and will avoid adverse effects of trenching and maintenance access in the open space portions of the property. The plastic (PVC) piping for the collection system will range in size from 2-inch to 4-inch diameter. The extensive length of pipeline construction is made feasible and practical in this situation because of the low installation costs for small diameter plastic pipe; costs are much lower than for conventional gravity sewers.

The collection system will convey all septic tank effluent to a central treatment plant, to be located immediately alongside the northern edge of the practice range. The collection system will have two major branches: (1) one branch to serve the residential units, equestrian facility and the swim and tennis center; and, (2) a second branch to serve the golf course clubhouse and overnight lodging units. Both branches will require a central pump station, located approximately as shown in **Figure 1**. The pump stations will consist of below-ground concrete vaults ("wet wells") with multiple high-head pumps. Tentatively it is anticipated that each pump station would include a triplex pump arrangement (i.e., three pumps), each with a minimum motor capacity of 1.5 horsepower.

Treatment Facility

As previously stated, primary sedimentation is to be provided by the individual on-lot septic tanks. The remaining treatment will be provided by a central treatment plant, to be located adjacent to the practice range. The plant will occupy an area of about 3,000 to 4,000 square feet.

The treatment plant is proposed to be a fully-enclosed proprietary "package" system that will be modified, as needed, to suit the specific requirements of the Lion's Gate project. The treatment plant will produce secondary level effluent quality, as required to meet State Wastewater Reclamation Criteria for restricted irrigation uses. Thus far a specific treatment plant design/manufacturer has not been selected; this will be done following project approval when all discharge specifications and other requirements are finalized. The two treatment plants presently under consideration include a trickling filter design and a Sequencing Batch Reactor (SBR) design.

Regardless of the manufacturer, the treatment system that is ultimately selected for the project will consist of: (a) below ground, built-in-place concrete vaults for sedimentation and clarification; (b) oxidation process for secondary treatment; and, (c) liquid chlorination system for disinfection.

Additional features of the treatment system will include the following:

- It will be designed for continuous, reliable performance with contingency provisions for component malfunction; all critical mechanical components in the process stream will have duplex or redundant units to allow bypass for routine maintenance and repair while maintaining full compliance with effluent discharge specifications.

- Stand-by power will be provided along with a fully automated control system; in the event of a power failure, the standby power unit will automatically start and provide power to all treatment units.

- The facility will be entirely enclosed for security reasons and to prevent the release of odors; all gases exposed to or generated by the wastewater will be confined below the floor deck and will be deodorized prior to discharge.

- A plant control system will be provided to monitor status and performance of the equipment and instrumentation utilized in the treatment processes; an alarm will be initiated and operating personnel will be contacted automatically if a problem is detected by this system.

- The treatment plant will be fenced for safety and security.

Storage Facilities

Wastewater storage requirements will be addressed as follows.

1. **Short-Term Emergency Storage.** Short-term emergency storage for one day of peak flow will be provided by underground tanks located immediately alongside the treatment plant. It will have a capacity of 30,000 gallons. The emergency storage tank will be watertight and equipped with a sump pump to route the wastewater back into the treatment plant following the emergency outage. Each of the pump stations in the collection system will also have emergency storage capacity, roughly equal to one day of sewage flow from the respective service area, bringing the total emergency storage in the system to about two days of flow.

2. **Long-Term Wet Weather Storage.** Long-term (90-day) storage of treated wastewater during the wet season will be provided by a storage pond to be located in the "saddle" area immediately upslope and to the northwest of the practice range. The pond will be constructed through a combination of excavation and earth fill embankments, utilizing the natural hillslopes as much as possible. The pond will need to be lined with a clay, plastic or gunite liner to prevent leakage. A duplex pump system at the treatment plant will be provided to pump the treated effluent uphill to the storage pond; this will require a vertical "lift" of above 130 feet.

   The estimated size of the pond to satisfy the 90-day storage requirement has been determined through water balance calculations which are included in **Appendix C.** Various combinations of total depth and surface area are possible to provide the required storage of wastewater flow plus direct rainfall on the pond during the winter months. Subject to refinement during final facilities design, water balance calculations for an assumed "wet" rainfall year (150% of normal rainfall) show that the required storage pond would be roughly 16-feet deep (at capacity), with an additional two feet of free board and an overall maximum water surface area of about 30,000 ft^2. The storage volume of the pond at capacity would be approximately 8 acre-feet.

Disposal Facilities

Treated wastewater will be disposed of entirely by spray irrigation of restricted-access turf grass and open-space portions of the project. The areas planned for irrigation include the golf course practice range and chipping area, plus about three to four acres of open-space grassland knolls on the west side of the storage pond (see **Figure 1**). The proposed irrigation areas can be fed by gravity from the storage pond.

The overall land area required for irrigation, as determined from the water balance calculations (**Appendix B**) is estimated to be about 12 acres. This is based on the assumption of an eight-month irrigation season (roughly March through November). The calculations are based solely on the evapotranspiration requirements for irrigated pasture; they assume negligible loss of water to percolation. The wastewater/irrigation rate varies monthly, according to the climate and the plant requirements; the total wastewater irrigation rate over the 275-day irrigation season would be 28 inches, or an average of about 0.064 gal/day/ft^2.

The total volume of reclaimed water to be disposed of during the irrigation season includes the daily wastewater flow during the irrigation season, plus all wastewater and rainfall collected in the storage reservoir during the winter months. The total volume is estimated to be about 28.2 acre-feet in a wet rainfall year (i.e., one in ten frequency). Under average rainfall conditions this drops only slightly to 27.6 acre-feet.

WASTEWATER FACILITY OPERATION AND MAINTENANCE

The wastewater facilities for the Lion's Gate development are proposed to be operated and maintained by a public entity, such as a community services district, sanitation district, or other special district formed specifically for this purpose. Anticipated operation and maintenance requirements are described below for the different components of the system.

STEP Collection System

Maintenance of the STEP collection system will require on-lot inspections of septic tanks and individual pump systems to check for solids build-up in tanks, and proper functioning of pumps and controls, and periodic pump-out of septic tank solids (e.g., typically every three to five years). These inspections can either be carried out by District maintenance staff or by a contractor, such as a private plumbing/sewer or sanitary engineering contractor. In any event, this will require a formal access easement/agreement with the property owner. Inspection and maintenance of central pump stations and all pipelines will also be required. In the event of individual pump failures, it is anticipated that the District (or private contractor) would make the necessary repairs/replacement, with the cost borne by the individual property owner or owners affected. Routine septic tank pump-outs would also be arranged by the District, with the costs covered by an annual maintenance fee. To avoid later misunderstandings, very specific disclosure of this operation and maintenance program must be made to all property owners at the outset.

Treatment Plant

Operation and maintenance of the plant consists of visual checks of treatment processes for problems, performance of preventive maintenance on equipment, replenishing chemical supplies, repair of any malfunctioning equipment, sample taking, general housekeeping and monthly report preparation. All of this would be required to be carried out by a certified treatment plant operator who may be an employee of the District or contractor.

Spray Disposal Facilities

The spray disposal operations could be managed by either the treatment plant operator or by the golf course maintenance staff. This would entail normal maintenance of pumps, valves and pipelines, as well as monitoring of soil, vegetation and runoff conditions in the spray areas as specified in the Waste Discharge Requirements and Monitoring and Reporting Program adopted by the Regional Water Board.

SUMMARY OF ENVIRONMENTAL IMPACTS

Following is a summary of the key potential environmental impacts associated with the proposed wastewater facilities for the Lion's Gate project.

Sewage Collection System

Since all of the building sites are at a lower elevation than the proposed treatment plant, the sewage collection system will require several pump (or "lift") stations. The tentative location of the pump stations and other details of the proposed collection system are diagramed in **Figure 1.** The sewage collection lines themselves are planned to consist of a network of two-inch to four-inch diameter PVC pipe and numerous clean-outs for cleaning and maintenance purposes. No significant impacts are anticipated to be associated with the construction or maintenance of the effluent sewer lines.

The pump stations are a critical item in the collection system; they may be subject to mechanical failure of pumps or power outages, either of which could cause a back-up in the sewer system or discharge of septic tank effluent to the ground surface. Proper design and maintenance normally reduces these potential problems to levels of insignificance. For instance, a duplex or triplex pump system is recommended in order to have reserve pumping units on-line in the event of a mechanical failure. Alarm systems with auto-dialers, a standby generator for emergency power, and emergency storage capacity at the pump station are also recommended and in common usage in modern sewer pump station designs.

One other pump station impact has to do with the venting of sewage odors, which will be present in the immediate area of the pump station. Odor control is proposed to be achieved by venting through sub-surface soil "scrubber" trenches, or above-ground activated carbon canister-type filters. If properly maintained, these measure can be expected to reduce pump station odors to a level of insignificance.

Treatment Plant

There are three potential impacts associated with the treatment plant.

- **Visual Impacts**. The treatment plant will be enclosed within a building and screened by vegetation to minimize visual impacts. The plant building may be visible to project residents and the visiting public; but the exterior of the building will likely be built to blend with the project design and reduce this potential impact to an insignificant level.

- **Odors**. Odors from the proposed wastewater facilities would be confined to the immediate treatment plant area. The plant itself would be designed to capture and eliminate methane and hydrogen sulfide odors with a vacuum system and soil filtration. Based on the project plan and proposed design there should be no significant impacts as a result of odors from the wastewater facilities.

- **Safety Hazards.** Safety precautions would need to be observed by the treatment plant operators. The treatment plant, being enclosed and fenced, would not pose a safety risk to residents or passersby. Chlorine gas is not proposed to be used in the treatment plant, so the associated chemical releases and hazards would be absent. Based on the project plan and proposed design there will be no significant safety hazard impacts from the wastewater facilities.

Wastewater Storage Reservoir

There are four potential impacts associated with the wastewater storage reservoir.

- **Public Safety**. First, although the reservoir is proposed to be located well away from general public access, it will be in an open-space area and could pose an attractive nuisance to children and a potential drowning hazard. The hazard would be reduced to a less-than-significant level by fencing with a rough edge or strand of barbed wire at the top to discourage children or others from climbing over. To screen the fence from view, which would further discourage the curious and also act as a visual barrier, a closely-spaced hedge or fast-growing trees could be planted around the outside of the fence.

- **Mosquitoes**. The wastewater storage pond has the potential to be a site for breeding of mosquitoes, which are a nuisance and potential public health problem. This problem is usually controlled adequately by introduction of the mosquito fish *Gambusia*. Also, during the irrigation season, the water would be circulated through the pond with a portion removed each day for irrigation. The turnover and movement of water would interfere with the mosquito breeding cycle during the warm months. The mosquito problem is also greatly minimized by the remote location of the storage pond, well away from any residences or the general public. The combination of the pond site and normal design and maintenance measures should reduce the mosquito breeding hazard to a less-than-significant level.

- **Algae Formation**. Nutrient laden water (such as treated wastewater) in the presence of sunlight in a pond is conducive to the growth of algae. This can result in objectionable odors, as oxygen in the water is depleted by the growing algae. Also, the algae will detract from the visual appearance of the water and, in extreme cases, could contribute to fouling problems in the irrigation system. Possible control measure for algae recommended for consideration during facility design include: (a) aeration of the wastewater pond; (b) addition of chemicals such as non-toxic dyes; and, (c) promotion of duck week to block light penetration. With proper maintenance attention, these measures can be effective in reducing algae problems to a less-than-significant level.

- **Wastewater Overflow**. There is always the possibility of an overflow from a wastewater storage reservoir during high rainfall years, if the reservoir capacity is exceeded. To minimize or eliminate this possibility, the proposed reservoir has been sized to include: (a) surplus storage capacity to account for extreme wet-weather effects; and, (b) two-foot of freeboard in the pond above the projected maximum water depth. The calculated winter storage requirement is based on 90 days with no irrigation; an additional contingency available for a wet winter would be selective spray disposal during the rainy season. In particular, the grassland knolls near the reservoir site would provide suitable winter spray disposal capacity for emergency use without posing a threat of runoff to streams or ponding of treated wastewater in public use areas. In the future, should the wastewater flows exceed the system design, the wastewater storage pond could be expanded in capacity; additionally reserve leachfield area could be constructed near the treatment plant or pump stations for emergency use.

Spray Disposal Operations

The areas planned for spray disposal of treated effluent include the golf course practice and chipping area and the grassy hillside knolls adjacent to the proposed wastewater storage pond. These areas will have restricted access and activities, and limited opportunity for human contact with the treated wastewater. As such, they are suitable for disposal of secondary-treated and disinfected reclaimed wastewater. The potential impacts of the spray disposal operations include the following.

- **Public Contact With Reclaimed Wastewater**. The use of reclaimed wastewater for golf course irrigation would expose humans to possible physical contact with treated wastewater.

State Wastewater Reclamation Criteria recognize golf course irrigation as a suitable use for treated wastewater, and contain standards to protect against unacceptable risks to public health. For the proposed project the treatment of wastewater would be to a secondary level, which meets reclaimed wastewater standards for restricted golf course irrigation. The wastewater system could be upgraded and operated to meet the treatment standards for unrestricted landscape irrigation, as defined in Title 22, California Administrative Code, if necessary or desired. The two types of treatment systems under consideration for the project both have good track records in producing reclaimed wastewater; and, with diligent compliance with waste discharge requirements, the risks to public health should be minimal. The areas of the golf course proposed for irrigation are the practice range, which will be accessible primarily to maintenance staff, and the chipping area, which will have more general accessibility to the golfers. Both areas should be posted with appropriate signs indicating the irrigation with reclaimed water; and irrigation of these areas would need to be limited to times when people are not present, i.e., evenings. The other areas planned for irrigation are grassland knolls that are well removed from general public access. These sites are part of the project open space and would be accessible to an occasional hiker or horseback riders. Evening spray disposal in these areas is also recommended.

- **Potential for Downstream Pollution from Use of Reclaimed Wastewater**. Under proper operation, the proposed disposal of wastewater to land should not result in any noticeable impacts on surface water quality in local drainages or the West Branch of Llagas Creek which runs through the project area. This is because the "zero discharge" policy of the Regional Board would preclude direct surface water disposal into streams or drainages; and the spray disposal operations are planned to be confined to the irrigation season only. To further minimize the risks of reclaimed water runoff into streams, the proposed spray areas are setback 100 feet or more from local drainages.

Nitrate Loading Impacts

A critical water quality concern in the Llgas Groundwater Basin area, where the Lion's Gate project is located, is the concentration of nitrate in groundwater. Nitrate in drinking water can have serious health effects; and it is addressed through primary drinking water standards. The drinking water limit is 45 mg/l, as NO_3, and 10 mg/l as N (Note: 1.0 mg/l, as N, is equal to 4.43 mg/l as NO_3). The Llagas Groundwater Basin has documented high levels of nitrate attributable to agricultural wastes and fertilizer, wastewater disposal and other land use activities. Controlling new sources of nitrate and reducing existing sources is a high priority of the Santa Clara Valley Water District, Santa Clara County Health Department and the Regional Water Board. It has been the subject of a Federally-funded (Section 205j) water quality management study over the past several years, the Final Report for which was distributed for public review in November 1995.

Nitrate loading from the proposed Lion's Gate project will include that from golf course fertilizers, plus that from the on-site wastewater disposal system. An analysis of the golf course fertilizer contribution is presented as part of the Environmental Management Plan for the proposed golf course, prepared by The Audobon Cooperative Sanctuary System. The golf course nitrate analysis (included in **Appendix B**), estimates an annual nitrogen loading ranging from 262 lbs. to 1,965 lbs. of nitrogen, with a resultant nitrate-nitrogen concentration ranging from 0.6 mg/l to 4.5 mg/l reaching the groundwater. To account for the additional nitrate input from on-site spray disposal of wastewater, the annual mass loading of wastewater nitrogen that leaches into the groundwater must be estimated and added to the golf course fertilizer mass balance analysis. The mass nitrate-nitrogen loading from wastewater disposal is estimated conservatively to be about 263 lbs. per year. This is based on the following assumptions:

- average wastewater flow of 23,000 gpd;
- a total nitrogen concentration of 25 mg/l from the secondary treatment plant;
- 40% nitrogen removal in the wastewater storage through denitrification; and,
- 75% removal of nitrate-nitrogen in the spray areas, through plant uptake and denitrification in the soil.

Adding this contribution to the golf course fertilizer loading estimates gives a combined total nitrate-nitrogen loading estimate of 525 to 2,228 lbs. per year, which equates to a projected groundwater concentration of 1.2 mg/l to 5.1 mg/l. The equivalent concentration as NO_3 would be from about 5 to 23 mg/l.

The existing groundwater nitrate concentrations in the vicinity of the project site (at San Martin), as reported in the SCVWD Llagas Groundwater Basin Nitrate Study (November 1995), are indicated to be in the range of about 7 to 43 mg/l (as NO_3). Historic sampling of a water well on the project site is also reported to fall within this range. From this it can be concluded that wastewater disposal and fertilizer use associated with the golf course will not likely affect the groundwater nitrate concentrations in the immediate project vicinity or the Llagas Groundwater Basin as a whole. However, a localized increase in nitrate concentrations within the project site could occur and should be monitored as a precautionary measure in connection with the wastewater disposal system and the golf course maintenance activities. All water wells on the property should be periodically monitored for nitrate; additionally, a dedicated monitoring well immediately down gradient (east) of the wastewater spray field areas (practice range and chipping area) could be included to distinguish possible localized effects from the wastewater system. This would provide a basis for detecting any changes over time and making adjustments in fertilizer application rate or wastewater operations.

WASTEWATER ALTERNATIVES

A variety of alternatives to the proposed wastewater facilities were reviewed and considered prior to adopting the preferred approach described in this report. A brief review of the main options is provided below.

Individual Residential Septic Systems

The main alternative to the proposed wastewater system would include: (a) the use of individual septic systems for each residential building (and the Equestrian and Swim and Tennis Center); and, (b) a separate package treatment plant, storage pond and spray irrigation system solely for the golf course clubhouse and lodging units. This alternative is feasible, as studies to date have verified adequate soil depth and groundwater conditions to support individual septic systems at the residential building sites. The layout of the building sites has been planned to match the septic system options and limitations. A package treatment plant system for the golf course facilities is also feasible; it would be about one-half the size and capacity of the proposed wastewater system needed to serve the entire development. The advantages of the proposed wastewater plan over this option of utilizing residential septic systems are as follows:

- All wastewater treatment and disposal would come under the maintenance and management authority of a public district and certified wastewater personnel;
- A greater percentage of the wastewater would be made available for reclamation and reuse for irrigation of a portion of the golf course (the practice areas); reducing the demand on other irrigation water sources; and,
- The overall nitrate loading from the project would be reduced, since the treatment plant followed by irrigation removes a substantially greater amount of nitrate than do individual septic tank-leachfield systems. The use of package treatment plants with spray irrigation is identified as a nitrate control management objective in the Santa Clara Valley Water District's draft plan for the Llagas Groundwater Basin.

The one advantage of the individual residential septic system option would be the elimination of the STEP effluent collection system (and its associated pump stations and piping) in favor of a simple, on-site gravity flow system at each house.

Conventional Gravity Sewers

Conventional gravity sewers, as opposed to STEP (i.e., effluent) sewers, were considered as a system design option. Conventional sewers would eliminate the need for a septic tank at each house/ building; but the construction costs and excavation requirements for larger diameter gravity sewers, manholes and lift stations spread over the development area would offset the savings. The on-site treatment plant could be designed to accommodate either STEP effluent or raw sewage from a conventional sewer system. If conventional sewers were to be used, an additional screening and sludge handling process would be included at the treatment plant. Ultimately, disposal of the sludge would be by hauling to an approved landfill site. An advantage of the STEP system design for this project is the ability to incorporate surplus storage or emergency disposal capacity at the pump stations or individual buildings sites with the use of subsurface leachfield trenches. This is made possible because of the inclusion of septic tanks for primary treatment at each house/building. Septic tank effluent can be disposed in appropriately sited leaching trenches, but raw sewage cannot.

Municipal Sewerage

The possibility of extending sewer service from the City of Morgan Hill to the project site was considered in connection with prior development plans for the project site. The project site is not within the sewer service area of Morgan Hill and would require annexation and several miles of sewer pipeline construction. Due to the relatively small wastewater flows from the Lion's Gate Project, and the substantial distance to the Morgan Hill-Gilroy Regional System, sewer connection would not be a practical alternative.

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APPENDIX A

WASTEWATER STORAGE/DISPOSAL WATER BALANCE CALCULATIONS

LION'S GATE RESERVE
WATER BALANCE CALCULATIONS

AVERAGE RAINFALL YEAR

		POND AT START			WASTEWATER INPUT		PRECIPITATION		EVAPORATION			ET	DISCHARGE			
1	Days in Month 2	Volume (Gallons) 3	Depth (Feet) 4	Surface Area (Sq Ft) 5	Daily Flow (GPD) 6	Monthly Flow (Gallons) 7 (2*6)	Monthly Total (Inches) 8	Monthly Total (Gallons) 9	Monthly Total (Inches) 13	Monthly Total (Feet) 14	Monthly Evap. loss (Gallons) 15	Average Monthly (Inches) 16	Available Discharge (Gallons) 17 (3+10-15)	Monthly Flow (Gallons) 18	Monthly Loss 19 (15+18)	Increase Storage Volume (Gallons) 20
Oct	31	0	0.00	12,815	23,000	713,000	0.90	16,830	3.00	0.25	26,406	3.00	703,424	703,424	729,830	0
Nov	30	0	0.00	12,815	23,000	690,000	2.10	39,270	1.60	0.13	14,082	1.60	715,188	521,362	535,444	193,826
Dec	31	193,826	1.21	13,509	23,000	713,000	3.50	65,450	0.80	0.07	7,431	0.00	964,846	0	7,431	964,846
Jan	31	964,846	6.03	16,267	23,000	713,000	4.30	80,410	1.20	0.10	13,229	0.00	1,745,026	0	13,229	1,745,026
Feb	28	1,745,026	10.90	19,058	23,000	644,000	3.00	56,100	1.60	0.13	20,256	0.00	2,424,871	0	20,256	2,424,871
Mar	31	2,424,871	15.14	21,490	23,000	713,000	2.60	48,620	2.60	0.22	37,035	2.60	3,149,455	847,213	884,248	2,302,243
Apr	30	2,302,243	14.38	21,051	23,000	690,000	1.60	29,920	3.80	0.32	52,913	3.80	2,969,250	1,238,234	1,291,147	1,731,016
May	31	1,731,016	10.81	19,008	23,000	713,000	0.30	5,610	5.10	0.43	64,511	5.10	2,385,115	1,661,840	1,726,351	723,275
Jun	30	723,275	4.52	15,403	23,000	690,000	0.10	1,870	5.90	0.49	61,197	5.90	1,353,947	1,353,947	1,415,145	0
Jul	31	0	0.00	12,815	23,000	713,000	0.10	1,870	6.60	0.55	57,983	6.60	656,887	656,887	714,870	0
Aug	31	0	0.00	12,815	23,000	713,000	0.10	1,870	5.90	0.49	51,833	5.90	663,037	663,037	714,870	0
Sep	30	0	0.00	12,815	23,000	690,000	0.30	5,610	4.80	0.40	42,066	4.80	653,544	653,544	695,610	0
Oct	31	0	0.00	12,815	23,000	713,000	0.90	16,830	3.00	0.25	26,406	3.00	703,424	703,424	729,830	0
							18.90		42.90			39.30		9002911.73		

Ref: 95142AVG

Pond Max Surface Area	30,000	SpFt
Acre Square Feet	43560.00	
Gallons/Cu Foot	7.48	
Pond Bottom Area	12815.39	SpFt
Pond Mid Area	21407.70	SpFt
Pond Max Depth	15.00	Feet
Disposal Area Sq Ft	12.00	Acres
Side Slope	2.00	
Bottom Area	12815.39	

LION'S GATE RESERVE
WATER BALANCE CALCULATIONS

WET RAINFALL YEAR

		POND AT START			WASTEWATER INPUT		PRECIPITATION		EVAPORATION			ET	DISCHARGE			
	Days in Month	Volume (Gallons)	Depth (Feet)	Surface Area (Sq Ft)	Daily Flow (GPD)	Monthly Flow (Gallons)	Monthly Total (Inches)	Monthly Total (Gallons)	Monthly Total (Inches)	Monthly Total (Feet)	Monthly Evap. loss (Gallons)	Average Monthly (Inches)	Available Discharge (Gallons)	Monthly Flow (Gallons)	Monthly Loss	Increase Storage Volume (Gallons)
1	2	3	4	5	6	7 (2*6)	8	9	13	14	15	16	17 (3+10-15)	18	19 (15+18)	20
Oct	31	0	0.00	12,815	23,000	713,000	1.35	25,245	3.00	0.25	26,434	3.00	711,811	711,811	738,245	0
Nov	30	0	0.00	12,815	23,000	690,000	3.15	58,905	1.60	0.13	14,117	1.60	734,788	521,362	535,479	213,426
Dec	31	213,426	1.33	13,579	23,000	713,000	5.25	98,175	0.80	0.07	7,495	0.00	1,017,106	0	7,495	1,017,106
Jan	31	1,017,106	6.35	16,454	23,000	713,000	6.45	120,615	1.20	0.10	13,423	0.00	1,837,299	0	13,423	1,837,299
Feb	28	1,837,299	11.47	19,388	23,000	644,000	4.50	84,150	1.60	0.13	20,635	0.00	2,544,814	0	20,635	2,544,814
Mar	31	2,544,814	15.89	21,919	23,000	713,000	3.90	72,930	2.60	0.22	37,801	2.60	3,292,942	847,213	885,014	2,445,730
Apr	30	2,445,730	15.27	21,564	23,000	690,000	2.40	44,880	3.80	0.32	54,192	3.80	3,126,418	1,238,234	1,292,426	1,888,184
May	31	1,888,184	11.79	19,570	23,000	713,000	0.45	8,415	5.10	0.43	66,315	5.10	2,543,284	1,661,840	1,728,155	881,444
Jun	30	881,444	5.50	15,969	23,000	690,000	0.15	2,805	5.90	0.49	63,284	5.90	1,510,965	1,510,965	1,574,249	0
Jul	31	0	0.00	12,815	23,000	713,000	0.15	2,805	6.60	0.55	57,990	6.60	657,815	657,815	715,805	0
Aug	31	0	0.00	12,815	23,000	713,000	0.15	2,805	5.90	0.49	51,839	5.90	663,966	663,966	715,805	0
Sep	30	0	0.00	12,815	23,000	690,000	0.45	8,415	4.80	0.40	42,081	4.80	656,334	656,334	698,415	0
Oct	31	0	0.00	12,815	23,000	713,000	1.35	25,245	3.00	0.25	26,434	3.00	711,811	711,811	738,245	0
							28.35		42.90			39.30		9181350.07		

Ref: 95142WET

Pond Max Surface Area	30,000	SpFt
Acre Square Feet	43560.00	
Gallons/Cu Foot	7.48	
Pond Bottom Area	12815.39	SpFt
Pond Mid Area	21407.70	SpFt
Pond Max Depth	15.00	Feet
Disposal Area Sq Ft	12.00	Acres
Side Slope	2.00	
Bottom Area	12815.39	

APPENDIX B

NITRATE LOADING CALCULATIONS

APPENDIX B

Lion's Gate Project

Nitrate Loading Calculations for Wastewater Plus Golf Course Fertilizer

ASSUMPTIONS

- Golf Course Fertilizer Leached (F): 262 lbs to 1965 lbs (per Audobon Cooperative Sanctuary System)
- Total Annual Recharge Volume (R): 51.9 million gallons (per Audobon Cooperative Sanctuary System)
- Total Nitrogen (N_w) in Secondary Treated Effluent: 25 mg/l
- Wastewater Nitrogen Reduction Through Pond Storage (P): 40%
- Wastewater Nitrogen Reduction Through Plant Uptake and Soil Denitrification (I): 75%
- Average Wastewater Flow = 23,000 gpd = 8.4 million gallons/year.

CALCULATIONS

1. Wastewater Nitrogen Leached (W)

$W = 8.34\ (N_w)\ (1 - P)(1 - I)\ (8.4 \text{ million gallons})$
$W = (8.34)(25 \text{ mg/l})\ (1 - 0.4)\ (1- 0.75)(8.4)$
$W = 262.7 \text{ lbs/year}$

2. Total Combined NO_3-N Concentration in Recharge Water:

$$N_c = \frac{W + F}{(8.34)(R)}$$

$$N_c = \frac{262.7 + 262}{(8.34)(51.9)}$$

$N_c =$ 1.2 mg/l NO_3-N Low Estimate

to

$$N_c = \frac{262.7 + 1{,}965}{(8.34)(51.9)}$$

$N_c =$ 5.1 mg/l NO_3-N High Estimate

The Audubon Cooperative Sanctuary System

AUDUBON COOPERATIVE SANCTUARY SYSTEM

Audubon Conservation Services • PO Box 1226 • Cary, NC 27512 • (919) 380-9640

November 9, 1995

AN ANALYSIS OF THE POTENTIAL FOR NITROGEN LOADING AT LION'S GATE GC

Nitrogen fertilization at Lion's Gate GC will utilize soil and plant tissue testing analyses as guidelines for actual programs. This will minimize the total amount of nitrogen applied and make the most efficient use of materials. However, in order to determine the potential for nitrogen movement off-site via leaching to ground water the following analysis is offered:

Total Nitrogen application at the highest possible recommended rates: 26,188 pounds
Total acreage fertilized: 108
Acreage used in calculating recharge: Receiving rainfall: 253 Irrigated: 108

Leaching potential based on utilizing best management practices is evaluated by:

$$N_c = N_L/(8.34)(R)$$

N_C	=	nitrate concentration
R	=	recharge based on rainfall + irrigation - ET
N_L	=	nitrogen leached in pounds
8.34	=	conversion factor gallons to pounds
27,152	=	acre-inches to gallons

Research data under turf conditions has found that nitrogen leaching can range from less than 1 to 7.5% of the total applied (see enclosed articles).

Assuming 1% leaching:

N_C = 262 pounds/(8.34 pounds per gallon) (51.9 million gallons)
= 0.61 ppm NO_3-N

Assuming 7.5% leaching:
N_C = 1965 pounds/(8.34 pounds per gallon) (51.9 million gallons)
= 4.5 ppm NO_3-N

Questa Engineering Corporation
CIVIL, ENVIRONMENTAL, AND WATER RESOURCE ENGINEERS

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ADDENDUM TO WASTEWATER
FEASIBILITY STUDY FOR LION'S GATE RESERVE
Santa Clara County
February 13, 1996

EXISTING-FUTURE NITRATE LOADING COMPARISON

The following is intended to supplement the analysis and discussion of nitrate loading impacts of the proposed Lion's Gate project, which is contained in the December 1995 Wastewater Feasibility Study prepared by Questa Engineering Corporation.

The Lion's Gate project site is currently used for cattle grazing; and nitrogen associated with cow manure and urine represents the main current source of nitrate loading to groundwater and surface water runoff. Generally, in pasture and rangeland situations the majority of nitrogen in animal wastes is readily assimilated into the soil and vegetation. However, where soils are damp, where animals congregate and where they have direct access to streams and other drainages, a portion of the nitrogen will be carried by runoff or percolate into the groundwater. These are likely the current routes of nitrogen input to the Llagas Groundwater Basin from the project site.

Under the proposed project, the cattle grazing is planned to be significantly curtailed or entirely eliminated in favor of the golf course and residential development. From a nitrogen loading standpoint, this should effectively substitute the turf fertilizer and reclaimed wastewater for animal wastes as the principal source of nitrate from the project site. Because of the slow rate of groundwater movement, it is likely to take several years for any changes in water quality to be noticeable. Moreover, as indicated by the water-chemical mass balance analysis in the wastewater feasibility study the nitrate loading (in terms of resultant concentration) from the project is estimated to be roughly comparable to existing background groundwater conditions. Thus, any long-term change in groundwater nitrate concentration is likely to be very slight and difficult to discern.

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MECHANICALLY ASSISTED SITE TESTING PROGRAM AT CA-SCL-76 FOR A PROPOSED RESIDENTIAL PROJECT IN HAYES VALLEY SOUTH OF MORGAN HILL, SANTA CLARA COUNTY, CALIFORNIA

FOR

HAYES VALLEY DEVELOPMENT PARTNERS
405 El Camino Real
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ATTN: Mr. Tom Hix

BY

Colin I. Busby, Stuart A. Guedon, Melody E. Tannam and Donna M. Garaventa
with
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MARCH 1996

TABLE OF CONTENTS

1.0 INTRODUCTION

This limited and focused testing program was undertaken at CA-SCl-76 to identify the presence/absence, horizontal and vertical extent and integrity of any cultural resources in selected areas subject to future excavation for the proposed Lion's Gate Reserve Project. The project area, situated south of Morgan Hill and east of San Martin in southern Santa Clara County, is located in the Hayes Valley area bounded between Watsonville Road on the west, Coolidge Avenue to the east and roughly between San Martin Avenue on the north and Fitzgerald on the south [Figs. 1-2]. This report relies on previous assessment reports prepared for the project area (Garaventa et al. 1990, 1994, 1995).

The project is situated in an area which has undergone several reviews and surveys as a result of various cultural resource compliance projects. Four archaeological sites, CA-SCl-76, SCl-77, SCl-305/H and SCl-568 have been recorded within the boundaries of the proposed project although only one prehistoric site, CA-SCl-76, was relocated during the field survey(s) and subjected to a limited subsurface auger testing program to determine its horizontal and vertical extent.[1]

Within the study area, the earlier hunting and gathering lifeway of the *Mutsun* tribelet of the Costanoan Indians was supplanted by an agricultural land-use pattern associated with the Hispanic and American Periods.

During the Hispanic Period, the project area was situated within the *Rancho San Francisco de las Llagas*. Historic maps indicate that two of the rancho adobe dwellings, the Carlos Castro Dwelling site, a ca. 1828 structure and the Second Castro Dwelling also constructed ca. 1828, are situated within the probable boundaries of CA-SCl-76 although there is some uncertainty on the location of the latter. The complex of structures, and the dairy farm/cattle ranch on CA-SCl-76 includes several houses, barns, corrals, and unpaved roads which date to the historic period. This farm/ranch complex has been present since at least 1917 (USGS 1917) although early map information indicates a structure present in the vicinity of CA-SCl-76 as early as 1876 (Thompson and West 1876:56). This farm/ranch complex was purchased from the Lazard Lion estate in 1921 by Mr. Frank Hayes. He and his son, Carroll Hayes of San Martin, still lived on part of the *Rancho San Francisco de las Llagas* in ca. 1976. Later, when the property was subdivided, Carroll Hayes retained the mountain and valley area to run cattle (Pierce 1976:179).

The previous archival research, field inventory and auger testing program determined that CA-SCl-76 had a definite prehistoric component, a possible Hispanic era component, and may have an 1870s American Period component as well (Garaventa et al. 1990). The auger test program resulted in a revised definition of the prehistoric site boundary; the determination that a prehistoric midden layer was present at depths ranging from approximately 20-150 cm DBS (depth below present surface) with a potentially greater depth possible as indicated by the presence of diffuse carbon flecks in deep samples; and, the conclusion that CA-SCl-76 must be classified as a prehistoric site which has undergone considerable historic era disturbance. Supplemental archival research, a suitable subsurface site investigation program based on proposed project development plans and archaeological monitoring during either ground preparation and/or subsurface construction within and near CA-SCl-76 and the other three sites (CA-SCl-77, SCl-305/H and SCl-568) in the project area was recommended.

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1. The three other previously reported sites for the project area, CA-SCl-77, SCl-305/H and SCl-568, did not have any visible surface indicators of a prehistoric occupation at their recorded location nor did subsequent auger testing expose the presence of subsurface cultural materials.

This report discusses the results of a directed, mechanically assisted testing program within selected direct impact areas of the proposed project.

2.0 PROJECT LOCATION

The general study area is affiliated with the Santa Clara Valley with San Francisco Bay to the north, the Santa Cruz Mountains to the west, and the Diablo Range to the east. The proposed project area is commonly referred to as the "Hayes Valley" and is situated on the far eastern side of the Santa Cruz Mountains. Specifically, the project is located in Hayes Valley south of the Santa Teresa Hills and Morgan Hill and east of San Martin in the vicinity of Hayes Lane in an unincorporated area of southern Santa Clara County, California. The proposed project consists of the development of an approximate 1700 acre area situated between Watsonville Road on the west and Coolidge Avenue to the east roughly between San Martin Avenue on the north and Fitzgerald on the south (T 10S, R 3E United States Geological Survey (hereafter USGS) 7.5 minute quadrangle topographic map, Mt. Madonna, Calif. 1980 and Gilroy, Calif. 1981) [Fig. 2].

The valley, broadly open on the west narrowing to the east, trends east/west and is enclosed on the north and south by moderate-to-steep slope hills rising to ca. 400-800 feet. Lion's Peak at the southern edge of the project area rises to 1117 feet. The vegetation is classified as an oak savanna on the valley floor and lower slopes and chaparral/mixed broadleaf forest on the upper slopes. Oak or sycamore trees are present intermittently on the valley floor and southern slopes of the northern hills, and are much more numerous and dense on the northern slopes of the southern hills. Ground squirrel burrows are numerous throughout the project area.

The west branch of Llagas Creek (West Llagas Creek), a seasonal watercourse, flows west to east on the valley floor and then south to the Pajaro River Drainage. Other unnamed intermittent streams and springs are present in the study area. Soils range from light brown sandy loam in some areas on the valley floor and in the drainages, to reddish-brown to dark brown to black clayey loam adobe soil on the lower slopes, to rocky medium brown on the upper slopes and thin rocky soil on the ridgetops.

The project area is used primarily for cattle pasture with barbed-wire fences dividing the grazing areas. Agriculture has been practiced for many years on the valley floor and is currently dominated by annual crop grasses and weeds (oats and wheat, hay, alfalfa). Uncultivated areas support a thick growth of thistle (Yellow Star, Purple) and various wild mustards (Clark 1984:5).

3.0 PROJECT DESCRIPTION

The current proposed project is a planned development of approximately 40 residences on two to five acre lots situated on selected areas within the project area. In addition, a golf course and associated infrastructure improvements are presently proposed.

The archival data suggests that the four archaeological sites within the proposed project boundaries may be affected by the proposed development. CA-SCl-76 may be disturbed by access road construction, the golf course and other infrastructure improvements. Residential housing could affect the other cultural resources.

4.0 BACKGROUND REVIEW
4.1 NATIVE AMERICAN
4.1A Prehistoric

The project area and immediate vicinity have been subjected to several previous cultural resource assessments and surface surveys with generally positive results (Shkurkin et al. 1974a-b; Flynn 1978; Roop 1979; Clark 1984; Schmucker 1986; Roop 1988; Archaeological Resource

Management 1989 (hereafter ARM); Garaventa et al. 1990). Two cultural resource projects located adjacent to the project did not identify any prehistoric or significant historic era sites (Holman 1991; Runnings and Breschini 1992) (see Garaventa et al. 1995 for a review and Elsasser 1986 for a general review of San Francisco Bay regional and Santa Clara Valley prehistory).

CA-SCl-76

CA-SCl-76, the most important and extensive of all the sites within the proposed project, probably represents the remnants of a large aboriginal village (SMSB 1974a:15; Clark 1984:9-10). The site is located near three year round springs. Riparian vegetation and oak, buckeye, willow are present (SMSB 1974b). CA-SCl-76 has been described as a flake scatter of both chert and obsidian with noticeably dark soil in an area of 200 x 300 meters (SMSB 1974b). Moreover, "Local amateur archeologists have recovered 80+ mortars (with a greater number of pestles), numerous points and blades of fine quality, two serpentine ("steatite") tobacco pipes, and other archeological materials. In addition, three partial burials were uncovered . . . " (SMSB 1974a:15; repeated in Clark 1984:9; Note: Berry 1983 indicates at least four burials). The presence of shellfish (mussel, abalone) was also recorded (SMSB 1974b).

CA-SCl-76 would have been close to the northernmost extension of "Pleistocene Lake San Benito" (King and Hickman 1973:30, Map 6) and conforms to the ". . . large village reported by Fages in 1770 and Palou in 1774 to be in the vicinity of Gilroy" (SMSB 1974a:16). The later reconnaissance by Clark (1984:9-10) noted that even though CA-SCl-76 had been "thoroughly" surface collected, recent plowing revealed a ". . . quartzite mano, several possible groundstone fragments; chert flakes and cores, several retouched chert flakes or biface fragments" . . . "overlying a large midden area marked by fire-cracked rock, burnt bone, and shell fragments" (WBC 1984:#13, #8). These observations resulted in an extension of the site boundaries to 450 x 280 meters, an area much more extensive than initially reported (SMSB 1974a:10; WBC 1984:#10). The site was estimated as covering several acres with a historic component of "Several houses, barns, corrals, and unpaved roads pass over and through the site" (SMSB 1974b; WBC 1984). The degree of site integrity was considered "difficult to assess" as the result of the historic era component and channelization and ponding of major watercourses (WBC 1984:#19 and map).

The SMSB (1974a-b) collection from CA-SCl-76 consists primarily of locally available Franciscan formation cherts (primarily red-brown colored cherts with lesser numbers of green and variegated colors). Chalcedony, quartzite and obsidian are present, but considerably less common (and not identified as such in the catalog). Monterey formation chert is not represented in the collections. The lithic debitage consists of angular waste chunks and fragments of Franciscan chert cores along with mostly hard hammer percussion flakes. Over half of the hard hammer flakes are primary or secondary cortex flakes with few soft hammer percussion flakes are present. Pressure flakes are limited to screened residue from Shkurkin's "*4 liter sample*". Casual inspection of the CA-SCl-76 sample includes the presence of a biface, a drill, a pestle, a modified cobble, a mortar and a metate. A number of artifacts identified as manos are actually pieces of fire-cracked rock. Years of private collecting at Hayes Valley sites may explain the absence of such formal tools as projectile points, mortars and pestles in the Shkurkin collection. Chert debitage, which dominates the 1974 surface collection, is usually ignored by amateur collectors.

A tentative picture of prehistoric lithic procurement and manufacturing operations, probably applicable to both CA-SCl-76 and SCl-77 (see below), involves the securing of locally available Franciscan chert, transporting cortex-bearing nodules and chunks to a site, and the use of core-flake technologies to reduce the raw material into useable products. Limitations inherent in Shkurkin's total surface collection policy (e.g., collecting visible cultural objects) preclude an accurate reconstruction of the prehistoric technology. Smaller debitage such as soft hammer and pressure retouch flakes require a systematic sample and screening through relatively fine mesh (e.g., no larger than 1/8"). Marine and estuary shellfish species are present in the screened residue from the "*4 liter sample*". Identified species include *Mytilus edulis* (Bay Mussel), *Clinocardium nuttalii* (Nuttall's cockle), *Tivela stultorum* (Pismo clam), *Mya arenaria* (Soft shelled clam) or *Macoma nasuta* (Bent-nosed clam), and *Haliotis rufescens* (Red abalone). These shellfish resources may have been procured by either directly or through trade with another neighboring group.

This site, compared to the other regional sites, was probably a major habitation site opportunistically located along or in the immediate vicinity of the major trail between San Pablo Bay-Lower Sacramento Valley Delta south to the Pajaro River (see Elsasser 1986:48-49, Fig. 10 after Davis 1961 (in part)). In addition see 4.2A Hispanic Period for other possible site components.

4.1B Ethnographic

The project area lies within the *Mutsun* territory of the Costanoan. The closest known tribelet settlement was *kulu listak* (San Bernardino) (Levy 1978:485, #27) or, alternatively, the *unijaima* tribelet or subdivision which held the Pajaro Gap area and may have extended northward (King and Hickman 1973:I:33, Map 7, 34; C. King 1978b:437-438; Berry 1983). Researchers have estimated a population of 1000 to 1200 individuals for this area in 1770 (Levy 1978:485; C. King 1977:54). Historic accounts of the 1770s-1790s and archaeological data suggest that a number of tribelets may have had temporary camps within the vicinity of the study area throughout the prehistoric period and into the Hispanic Period (Kroeber 1925:465; T. King 1973; King and Hickman 1973).

The Costanoan aboriginal lifeway apparently disappeared by 1810 due to disruption by the introduction of new diseases, a declining birth rate, and the impact of the mission system. The Costanoan were transformed from hunters and gatherers into agricultural laborers (and in some cases, craft artisans) who lived at the missions and worked with former neighboring Native American groups (Levy 1978:486). Later, because of the secularization of the missions by Mexico in 1834, most of the aboriginal population gradually moved to ranchos to work as manual laborers (Levy 1978:486).[2]

4.2 HISTORIC PERIOD
4.2A Hispanic Period

Spanish explorers in the late 1760s and 1770s were the first Europeans to traverse the Santa Clara Valley. The first party, that of Gaspar de Portola and Father Juan Crespi, arrived in the Alviso-San Jose area in the fall of 1769. Sergeant Jose Francisco Ortega of the Portola and Crespi party was sent to explore the eastern portion of San Francisco Bay, and likely forded both the Guadalupe River and Coyote Creek near their mouths, but no exact record of his journey remains (Beck and Haase 1974:17-17; James and McMurry 1933:8). The following year, Pedro Fages led another party which was the first European to enter the Santa Clara Valley, and in 1772, Fages returned to the same vicinity with Crespi. Even though the routes of the early explorers cannot be determined with total accuracy, a number appear to have passed through the general vicinity of the study area. These include the expeditions of Fages in 1770, Fages and Crespi in 1772; Rivera and Palou in 1774, and Hezeta and Palou in 1775 (Beck and Haase 1974:16-17; Levy 1978: 486). In 1776, the exploration party of Juan Bautista de Anza and

2. For a more extensive review of the Costanoan see C. King (1974, 1978a-b), T. King (1973a), T. King and Hickman (1973), Kroeber (1925:462-473), and Levy (1978:485-495).

Father Pedro Font travelled through the Santa Clara Valley. He camped on the east side of Santa Teresa Boulevard south of Watsonville Road alongside Arroyo de las Llagas on March 24, 1776 at about present day San Martin (Santa Clara County Historical Heritage Commission 1979:62; Arbuckle and Rambo 1968:30-31). The favorable reports of Anza and Font led to the establishment of both Mission Santa Clara and the Pueblo San Jose de Guadalupe in 1777 (Beck and Haase 1974;17; Findlay 1980:3-4).

Shkurkin et al. (1974a-b) state that CA-SCl-76 may have been the "large village" reported by Fages in 1770 and Palou in 1774 (SMSB 1974a:16 although this appears to contradict research by King and Hickman (1973:31) who indicate that the locations described by Fages and Palou are more general in location and can not be securely tied a specific location.

Within the province of Alta California, the Pueblo of San Jose de Guadalupe was one of the three towns founded to administer and coordinate the missions and presidios of the province. The pueblos played an integral part in the conquest of Alta California (by Spain) for they created a resident civilian population in the area (Hendry and Bowman 1940:750).

Mission Santa Clara, the 8th of the 21 missions founded in California, was established on January 12th, 1777, about 10 months before the founding of the pueblo of San Jose (Hart 1978:388; Hendry and Bowman 1940:918). Until 1851, Mission Santa Clara provided for all the religious needs of the Pueblo San Jose de Guadalupe (Hall 1871:84). Mission San Juan Bautista the 15th of 21 missions was founded in 1797 (Hart 1978:277; 381). Either of these two of the seven missions located within Costanoan territory, may have had a major impact on the aboriginal population living in the vicinity of the project area (Hart 1978:96).

The Mexican revolt against Spain (1822) followed by the secularization of the Missions (1834) changed land ownership patterns in the Santa Clara Valley. The Spanish philosophy of government was directed at the founding of presidios, missions, and secular towns with the land held by the Crown, whereas the later Mexican policy stressed individual ownership of the land (Findlay 1980:6). During the Mexican Period, vast tracts of land were granted to individuals, including former Mission lands which had reverted to public domain. In the Santa Clara Valley, seventeen parcels were granted from Pueblo Lands, and thirteen from the lands of Mission Santa Clara. The general trend for granting these lands was to give away the land farthest from the Pueblo and Mission first. Each grant also usually contained both valley and uplands acreage as well as access to a water supply (Broek 1932:44-44).

During the Mexican Period (1821 to 1846) and into the American Period, the project area was situated in *Rancho San Francisco de las Llagas* ("St. Francis of the Wounds" or Sores, Ulcers, Stigmatas, etc) (United States Surveyor General 1863; Healey 1866; Thompson and West 1876:56). This rancho of ca. 26,632 acres was granted by Governor Figueroa to Carlos Castro on February 3, 1834 and sold to Daniel and James Murphy on August 16, 1848, who sold it in 1851 to Martin and James Murphy. The latter two patented it on March 19, 1868 (Hendry and Bowman 1940:960, 962; Arbuckle and Rambo 1968:30-31). Carlos Antonio Castro was born ca. 1774 in Fuerte Sonora and came with his parents, Joaquin Isidro Castro and Maria Martina Botiller (Botillier) with the 1776 Anza expedition.

The Carlos Castro Dwelling site of ca. 1828 adobe structure probably stood near the F.P. Hayes ranch house and on the south side of the creek (Hendry and Bowman 1940:960, Dwelling #102). In addition, the Second Castro Dwelling also constructed ca. 1828 was probably nearby and made of adobe (Hendry and Bowman 1940:961-962, Dwelling #103). In addition to the ca. 1828 Hispanic Period dwellings, roads or other features are located in the vicinity of the proposed project area. One is the *Old National Mexican Road from San Francisco to Monterey* about 3/4 of a mile to the east (also known as *El Camino Real*, and now known as the Monterey Highway/State Route 101). In addition, the west side of the proposed project was previously bounded by the road from San Jose to Watsonville, now known as Watsonville Road (Thompson and Herrmann 1881). In fact, these two roads and a third, further to the east trifurcated in the northern part of *Ranch San Francisco de las Llagas* (e.g., Healey 1866).

4.2B American Period

The population of the Santa Clara Valley expanded as a result of the Gold Rush (1848), followed by the construction of the railroad to San Francisco (1864) and the completion of the transcontinental railroad in 1869 (Findlay and Garaventa 1983). The Early American Period in the Santa Clara Valley is characterized by an influx of Euro-Americans and rapid growth which overwhelmed the Hispanic residents and their economic/cultural traditions which centered on missions, presidios, and ranchos.

Throughout the late 19th century in the Santa Clara Valley, rancho, Pueblo, and Mission lands were subdivided as the result of population growth, the Anglo-American takeover, and the confirmation of property titles. Large cattle ranches were converted to farming varied crops, and this agricultural land-use pattern continued throughout the American Period. During the early American Period (1847-1876) stock raising predominated, but declined after the drought of 1863-1864, after which wheat-growing became the primary agricultural activity (Bean 1978:226-227) along with dairy farms, and orchards in the 1860s-1870s. During this period, the first experiments with horticulture and other crops took place. After 1875, the success of many agricultural experiments and expansion of markets via rail encouraged the development of horticulture.

Still later, the development of the refrigerator railroad car (ca. 1880s) allowed the transport of agricultural produce to distant markets and greatly increased the development of horticulture in the Santa Clara Valley. As a result, during the later American Period and into the Contemporary Period (ca. 1876-1940s), horticulture/fruit production became a major industry (Broek 1932:76-83). From 1875 onward, the need for an expanding market led to innovations in fruit preservation and shipping including drying fruit, canning fruit, and shipping fresh fruit in refrigerated cars (Findlay 1985:13). After 1875, the success of many agricultural experiments and expansion of markets via rail encouraged the development of horticulture. Horticulture permitted smaller parcels of land in an ever more populous valley and provided a labor-intensive but profitable product.

In turn, this created a wider economic boom which attracted new residents to the Santa Clara Valley. One promotional book noted that although the 1890 census listed San Jose's population at 18,500, the community was much larger as a result of newly populous suburbs (Metropolitan Publishing Company 1892:5). By 1900, the Santa Clara Valley was a world center for canned and dried fruit. Between 1875 and the 1960s, the Santa Clara Valley was dominated by its celebrated orchards (Broek 1932:60-70; Findlay 1985:12).

Within the Santa Clara Valley, the City of San Jose served as a primary service center, the focus of industry, County seat, financial center, and social center. Most of the institutions for higher education and citizen elite resided in San Jose or its twin Santa Clara (Broek 1932:93). Initially railroads were intensively used by passengers as well as bulk transport of goods. The automobile era with both cars and trucks and reliance on roads, highways, and freeways resulted in a shift along these transportation nodes. Bulk transportation related activities remain close to rail services. In contrast, services - administrative, offices, churches, schools and etc. do not require such proximity, nor is such close proximity sought (Broek 1932:152). The residents of San Jose took to the automobile avidly. The first horseless carriages appeared in 1900, and the first "service station" opened in 1902. By 1910, San Jose had undertaken a long-term project to upgrade streets for auto travel; by 1930, most of the roads were paved and extensively used, especially among the rural population (James and McMurry 1933:141-142,164; McMillan and McMillan 1930).

During the 1850s into the 1870s the study area was situated in undeveloped agricultural lands south of the City of San Jose bounded by Watsonville Road on the west and Monterey Road, the former *El Camino Real*, to the east (Healey 1866; Thompson and West 1876). The latter, Monterey Road is located about 3/4 of a mile to the east and was important as the route of the stage and, later, the railroad. A limited number of historical landmarks or points of interest are located in the general study area although none appear to be located within the proposed project (see Garaventa et al. 1995 for a discussion).

Within the proposed project area, the complex of structures, and the dairy farm/cattle ranch on CA-SCl-76 includes several houses, barns, corrals, and unpaved roads which date to the historic period (SMSB 1974b; Berry 1983). This farm/ranch complex has been present since at least 1917 (USGS 1917) although early map information indicates a structure present in the vicinity of CA-SCl-76 as early as 1876 (Thompson and West 1876:56). By 1917, five structures were present north of *Arroyo de las Llagas*, while one could be found to the south. A review of the USGS topographic map series indicates that this farm/ranching complex underwent considerable modification between 1917 and 1980 (USGS Morgan Hill 1917; USGS Gilroy, Calif. 1955, 1968, 1981; US War Department 1939-40 Morgan Hill, Calif.). No other buildings appear on the USGS series for the project area (USGS Morgan Hill 1917, Mt.Madonna, Calif. 1955, 1973, 1980).[3]

5.0 ARCHAEOLOGICAL FIELDWORK

5.1 PREVIOUS WORK

A hand auger test program was conducted at CA-SCl-76 in 1990 (Garaventa et al. 1990) with the purpose of: (1) determining the horizontal and vertical boundaries of the cultural deposits; (2) estimating the proportion of the site which contained cultural material; and, (3) exploring reasonable alternatives for further data recovery.

Fourteen of the 22 auger units were culturally positive with the midden deposit ranging from ca. 20 cm DBS to a maximum depth of ca. 150 cm DBS (see Garaventa et al. 1990:Table 1). The data interpretation resulted in a revised definition of the site boundary; the determination that a midden layer is present at depths ranging from approximately 20-150 cm DBS (depth below present surface) with a potentially greater depth possible as indicated by the presence of diffuse carbon flecks in deep samples; and, the conclusion that CA-SCl-76 must be classified as a prehistoric site which has undergone considerable historic era disturbance. Cultural material noted included lithic debitage (surface and subsurface), burned bone (non-human), a shell fragment, and diffuse carbon flecks.[4]

The auger test program resulted in a revised definition of the prehistoric site boundary; the determination that a prehistoric midden layer was present at depths ranging from approximately 20-150 cm DBS (depth below present surface) with a potentially greater depth possible as indicated by the presence of diffuse carbon flecks in deep samples; and, the conclusion that

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3. Frank Hayes and his son, Carroll Hayes of San Martin, who still lived on part of the *Rancho San Francisco de las Llagas* in ca. 1976 bought the ranch from the Lazard Lion estate in 1921. Later, when the property was subdivided, Carroll Hayes retained the mountain and valley area to run cattle (Pierce 1976:179). No additional information is readily available.

4. The lack of an adequate sample precluded the use of radiocarbon dating.

CA-SCl-76 must be classified as a prehistoric site which has undergone considerable historic era disturbance.

In summary, the previous archival research, field inventory and auger testing program determined that CA-SCl-76 had a definite prehistoric component, a possible Hispanic era component, and may have an 1870s American Period component as well (see Thompson and West 1876:56). No other sites were observed on the property and the three other previously reported sites for the project area, CA-SCl-77, SCl-305/H and SCl-568, did not have any visible surface indicators of a prehistoric occupation at their recorded location nor did auger testing discover the presence of subsurface cultural materials.

Supplemental archival research, a suitable subsurface site investigation program based on proposed project development plans and archaeological monitoring during either ground preparation and/or subsurface construction within and near CA-SCl-76 and the other three sites (CA-SCl-77, SCl-305/H and SCl-568) in the project area was recommended.

5.2 CURRENT SITE TESTING PROGRAM

5.2A Purpose, Methods and Procedures

A mechanically assisted site testing program was conducted on March 1, 1996 within CA-SCl-76 in areas likely to be impacted by deep excavation during project construction (e.g., proposed lake areas; club house and tennis courts, main access roads, etc.) [Fig. 3]. The objectives of the testing program were to:

(1) Determine the presence/absence of subsurface cultural deposits associated with CA-SCl-76;

(2) Refine the boundaries of the site and determine its vertical and horizontal extent; and,

(3) Evaluate and determine the significance of the cultural resource in accordance with established professional and regulatory criteria.[5]

Backhoe Test Units (BTUs) were intuitively placed by the Principal Investigator within potential impact areas using available site information and project plans. All BTUs were located in reference to available datums and placed on the project map (Forsgren Associates 1995) [Fig. 4].

A total of 15 BTU's were excavated. The BTUs consisted of small trenches, approximately 5 feet/152.5 cm long and 24 inches/61 cm wide, mechanically excavated in approximately 20 cm "lifts" to culturally sterile subsoil or 5-6 feet (152/183 cm) below the present ground surface.[6]

Each 20 cm lift was visually inspected for the presence/absence of cultural materials and sediment color and composition. Standard field records were maintained and photographs were taken as appropriate. No screening of the excavated sediment was undertaken and no sediment samples were collected. The north wall of each unit was sketch profiled and photographed. All of the BTUs were mechanically backfilled.

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5. In this case, the regulatory requirements of the California Environmental Quality Act (CEQA) and cultural resources requirements of the County of Santa Clara.

6. Note: the combined use of English and metric units is a consequence of the existing construction plans and backhoe "bucket" size.

5.2B Testing Results

All units were located within the recorded CA-SCl-76 site boundary and excavated to depths ranging from approximately five to six feet (152/183 cm) below the present ground surface [Fig. 3].[7] The soils belong to the Los Robles series and consist of well-drained clay loams underlain by stratified basic igneous rock alluvium. The typical Los Robles soil profile has a surface layer of dark brown neutral clay loam approximately nine inches (23 cm) thick. The subsoil is dark brown and brown, neutral clay loam and gravelly clay loam that is underlain at a depth of 58 inches (147 cm) by a yellowish-brown, neutral gravelly fine sandy clay loam (Lindsey 1974:24-25). The general stratigraphy and sediments are similar throughout the BTUs except for the presence/absence of the surface layer and generally conform to the published description of the Los Robles soil series (see Table 1 for a typical profile).[8]

No prehistoric or historic artifacts, ecofacts or culturally modified soils were observed either on the surface in the immediate vicinity of the BTUs or in the sediments excavated from the BTUs.

TABLE 1
TYPICAL PROFILE - UNITS 5 and 10, NORTH WALL

Surface Layer (when present): Dark greyish brown clay loam with grass, rootlets, etc. present
Average thickness: 9 inches (23 cm)
Range: 0.5-1.0 feet (12-25 cm)
Boundary between Surface and A: abrupt and straight

Stratum A: very dark gray (10YR 3/1) clay loam (surface organics present)
Average thickness: 3.5 feet (107 cm)
Range: 2.5-4.0 feet (76-122 cm)
Boundary between A and B: straight

Stratum B: dark yellowish brown (10YR 3/3 to 10YR 4/4) sandy clay loam
Average thickness: unknown
Range: unknown

Notes: Both A and B often had small fragments of decayed sandstone and other rock present (probably originating from several of the exposed Franciscan formations present on the surrounding hills).

6.0 FINDINGS AND RECOMMENDATIONS

Four prehistoric and historic sites, CA-SCl-76, SCl-77, SCl-305/H and SCl-568, have been recorded in the proposed project area [Fig. 2]. The previous surface survey and subsurface auger test program conducted at the recorded locations of these sites indicated that only CA-SCl-76 was still present although it had undergone considerable contemporary disturbance.

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7. Excavation at BTU 15 was stopped at a depth of two to three feet (61-91 cm) due to flooding and sidewall slumping.

8. At least two gross soil color and texture changes with depth were noted in all units except for BTU 15 which was abandoned after two to three feet of excavation due to flooding and slumping of the trench sidewalls. Layer 1, a dark brown "organic" stratum probably includes both the surface layer and subsoil noted for the Los Robles series. Layer 2, a yellow-brown stratum appears to represent the sediment underlying the Los Robles subsoil. The extremely high moisture content of the sediments masked the differentiation of any other layers and affected strata color differences. No sediment samples were collected.

The presence/absence testing program conducted within the recorded CA-SCl-76 boundary determined that no subsurface prehistoric or historic cultural deposits associated with the site are within the areas to be potentially impacted by deep excavation during project construction (e.g., proposed lake areas; club house and tennis courts, main access roads, etc.). In addition, the lack of subsurface cultural materials resulted in a revision of the site boundary with the new southern perimeter placed just to the north of the proposed main access road for the Lion's Gate Reserve Project. The previous boundary determination had been based on the presence of isolated surface finds and an abbreviated, minimal auger testing. It is probable, based on the results of the current testing program, that the majority of CA-SCl-76 is present to the north of the proposed access road and is within the present ranch complex [Fig. 4].

6.1 RECOMMENDATIONS

It is Basin Research Associates considered opinion that the construction planned for the Lion's Gate Reserve Project can proceed as planned with the following recommendations for cultural resources.

Construction Monitoring of grading and subsurface construction by a qualified archaeologist is recommended in areas defined as archaeologically sensitive. It is the opinion of Basin Research Associates that CA-SCl-77, SCl-305/H and SCl-568 should be monitored during both surface preparation and subsurface construction. These sites could not be relocated during the previous surface inventory and subsequent auger test programs did not yield any subsurface cultural materials in their reported locations. An intermittent/spot monitoring program of construction in the vicinity of CA-SCl-76 is recommended for any subsurface disturbance below 12 inches (30 cm) within 25 feet (8 meters) of the revised site boundary due to slight possibility of exposing isolated cultural materials associated with the site. The Project Archaeologist should have the latitude to modify or terminate any portion of the monitoring program at any time if significant cultural materials[9] are not exposed during ground preparation and/or subsurface construction.

If any potentially significant cultural materials are exposed during monitoring, construction should stop within 10 feet (3 meters) of the find pending evaluation by the on-site archaeologist as to appropriate action. If an on-site archaeologist is not present, a qualified archaeologist should be retained for professional advice. Any artifacts or samples collected as part of the initial discovery, monitoring, or mitigation phases must be cataloged, conserved, analyzed, evaluated, reported and curated along with any associated documentation in a professional manner consistent with current archaeological standards.

It is further recommended that the project proponent develop an *Unexpected Discovery Plan* to deal with the exposure of significant archaeological finds including Native American skeletal remains during construction within the Lion's Gate Reserve Project area. This plan should discuss appropriate mitigation of significant cultural resources including additional monitoring of subsurface construction and/or the systematic removal of the cultural resource and subsequent reporting/curation requirements.

9. Significant artifacts or features include, but are not limited to, aboriginal human remains, chipped stone, groundstone, shell and bone artifacts, concentrations of fire cracked rock, ash, charcoal, shell, and bone; and historic features such as privies or building foundations.

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n.d.a [Blueline Map - Aerial of proposed Lions Gate Project, Morgan Hill.] Unknown scale. N.p., n.p. Copy provided by Bert Verrips, Nolte and Associates, San Jose. [Garaventa et al. 1990 project configuration.]

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8.0 ATTACHMENTS

8.1 APPENDIX I: FIGURES

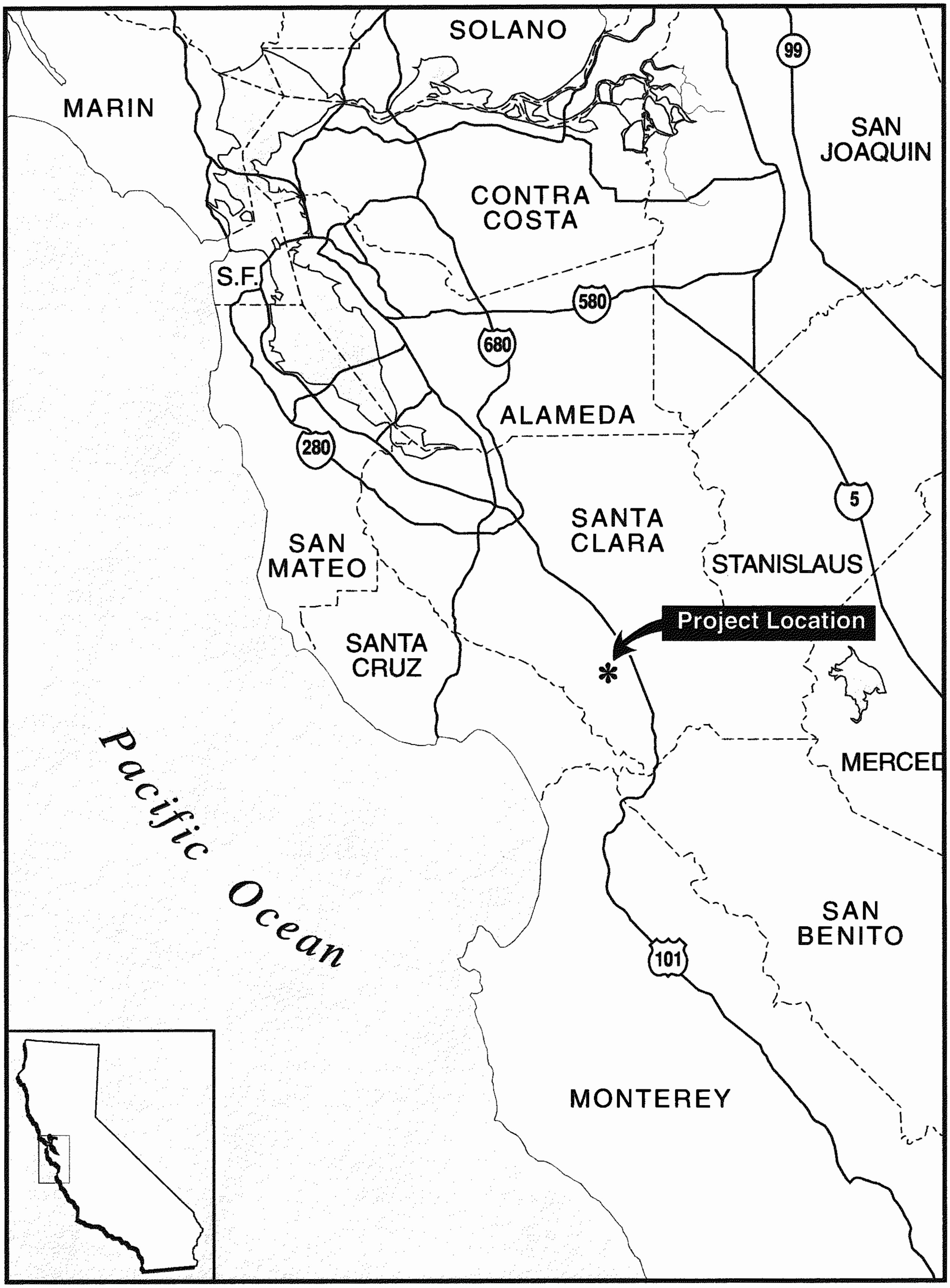

Figure 1: Project Location

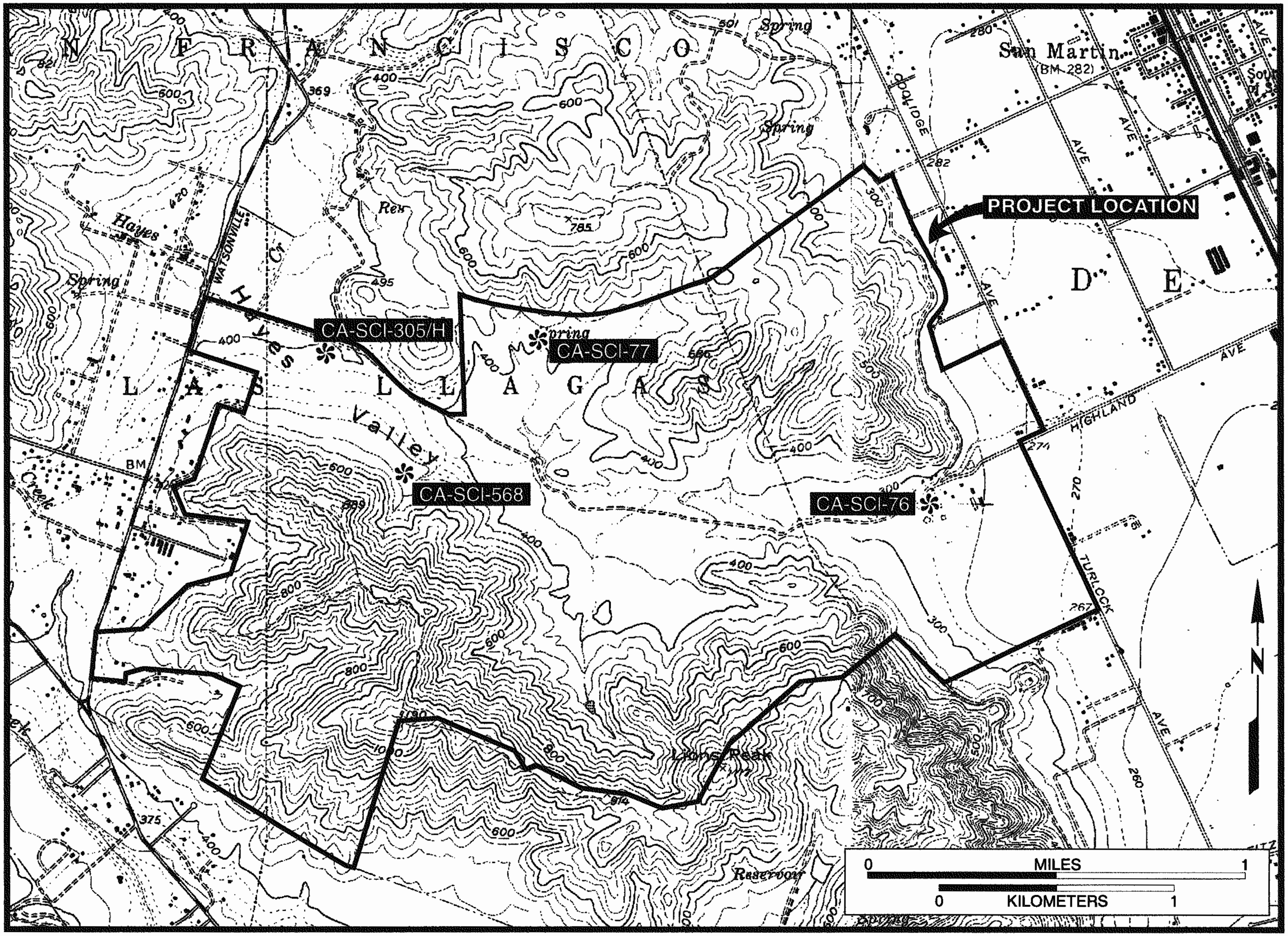

Figure 2: Project Location (USGS Mt. Madonna, Calif. 1980 and Gilroy, Calif. 1981)

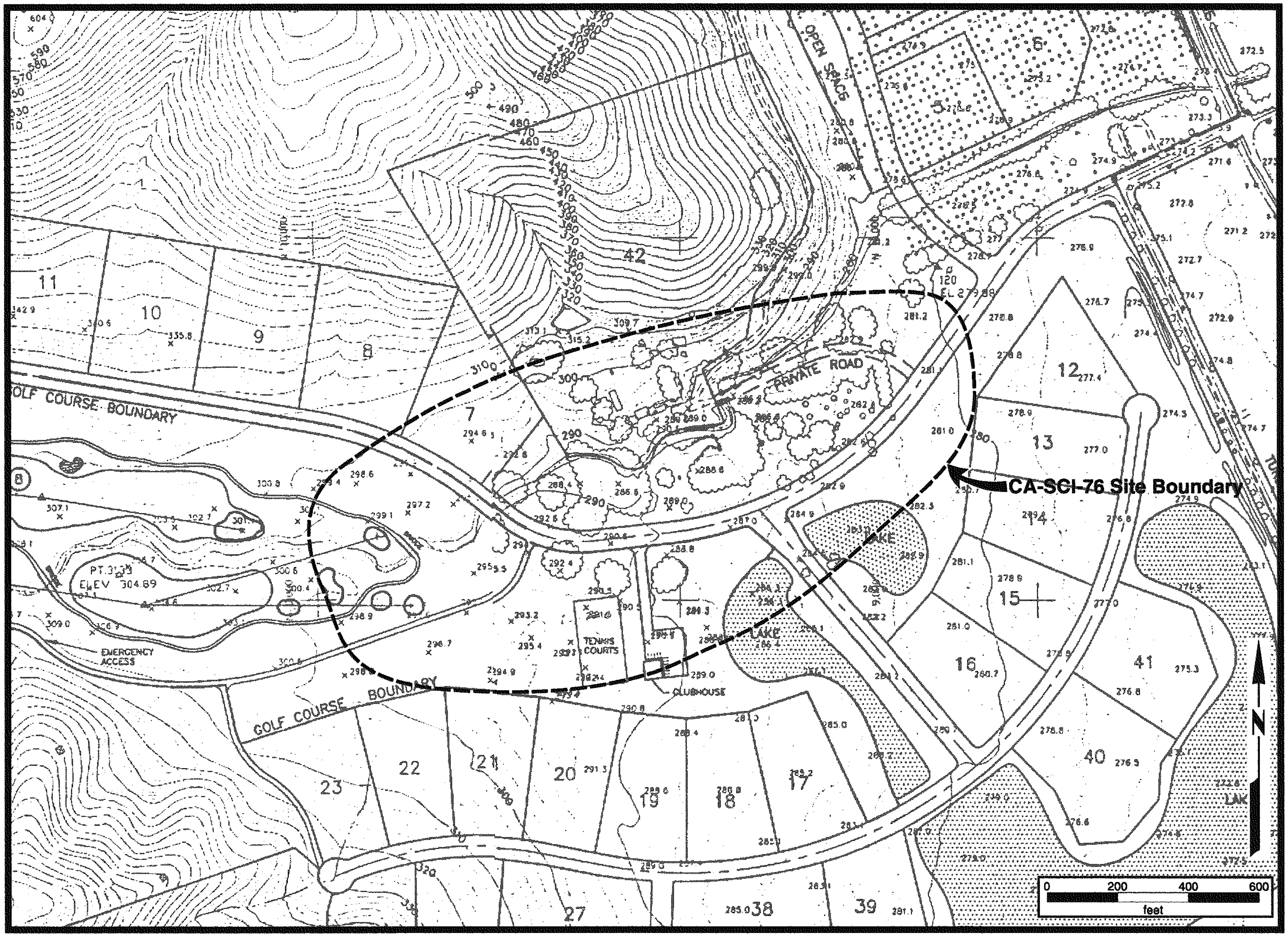

Figure 3: Proposed Development and CA-SCI-76 Site Boundary Prior to Subsurface Testing Program

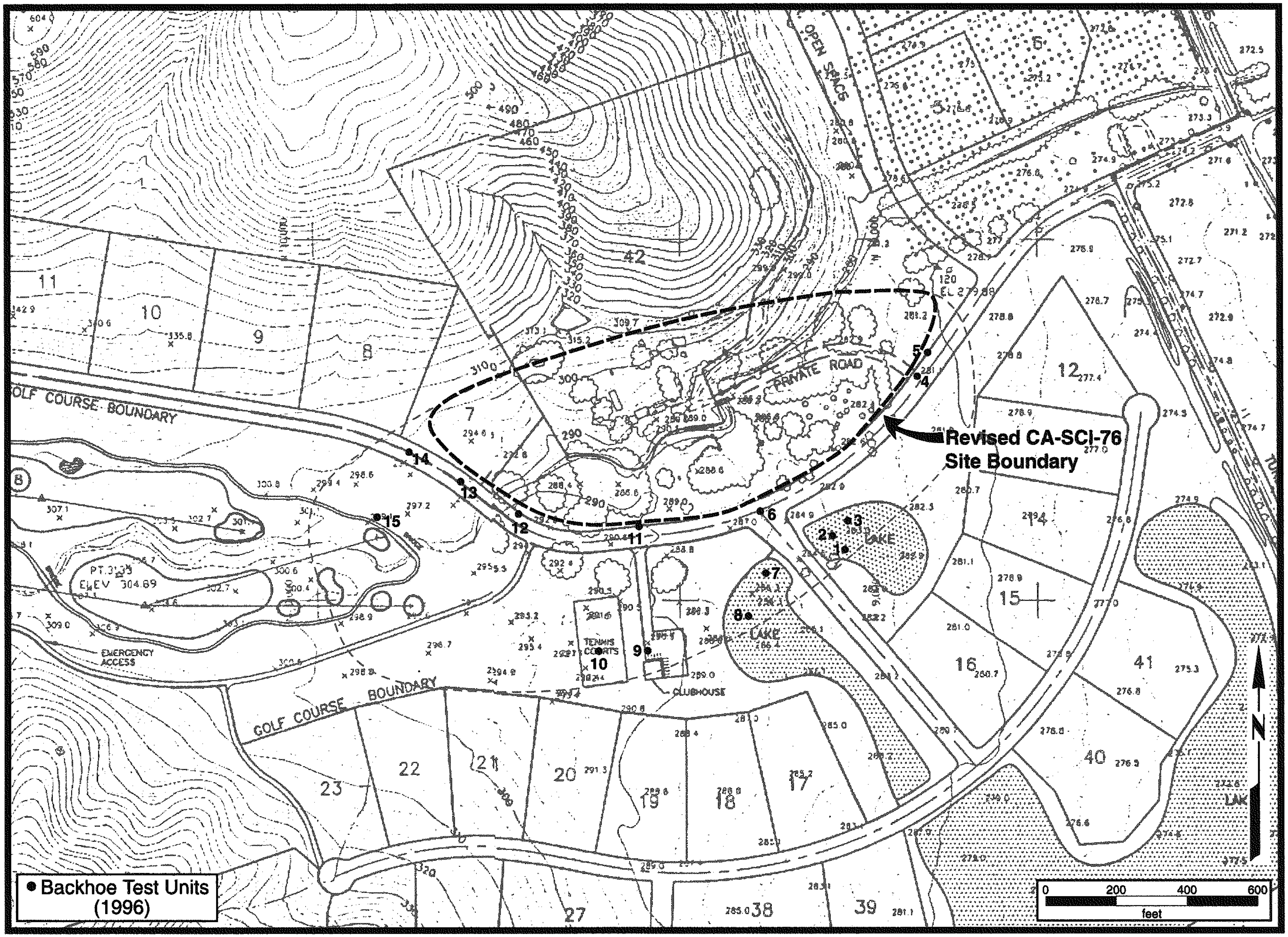

Figure 4: Proposed Development with Location of Backhoe Test Units and Revised CA-SCI-76 Site Boundary

CA-SCl-76 [Figs. 1-2]

A limited and focused testing program was undertaken at CA-SCl-76 to identify the presence/absence, horizontal and vertical extent and integrity of any cultural resources in selected areas subject to future excavation for the proposed Lion's Gate Reserve Project (see Garaventa et al. 1990, 1994, 1995).

ARCHAEOLOGICAL FIELDWORK
PREVIOUS WORK

A hand auger test program was conducted at CA-SCl-76 in 1990 (Garaventa et al. 1990) with the purpose of: (1) determining the horizontal and vertical boundaries of the cultural deposits; (2) estimating the proportion of the site which contained cultural material; and, (3) exploring reasonable alternatives for further data recovery.

Fourteen of the 22 auger units were culturally positive with the midden deposit ranging from ca. 20 cm DBS to a maximum depth of ca. 150 cm DBS (see Garaventa et al. 1990:Table 1). The data interpretation resulted in a revised definition of the site boundary; the determination that a midden layer is present at depths ranging from approximately 20-150 cm DBS (depth below present surface) with a potentially greater depth possible as indicated by the presence of diffuse carbon flecks in deep samples; and, the conclusion that CA-SCl-76 must be classified as a prehistoric site which has undergone considerable historic era disturbance. Cultural material noted included lithic debitage (surface and subsurface), burned bone (non-human), a shell fragment, and diffuse carbon flecks.

The auger test program resulted in a revised definition of the prehistoric site boundary; the determination that a prehistoric midden layer was present at depths ranging from approximately 20-150 cm DBS (depth below present surface) with a potentially greater depth possible as indicated by the presence of diffuse carbon flecks in deep samples; and, the conclusion that CA-SCl-76 must be classified as a prehistoric site which has undergone considerable historic era disturbance.

CURRENT SITE TESTING PROGRAM
Purpose, Methods and Procedures

A mechanically assisted site testing program was conducted on March 1, 1996 within CA-SCl-76 in areas likely to be impacted by deep excavation during project construction (e.g., proposed lake areas; club house and tennis courts, main access roads, etc.) [Fig. 1]. The objectives of the testing program were to:

(1) Determine the presence/absence of subsurface cultural deposits associated with CA-SCl-76;

(2) Refine the boundaries of the site and determine its vertical and horizontal extent; and,

(3) Evaluate and determine the significance of the cultural resource in accordance with established professional and regulatory criteria.

Backhoe Test Units (BTUs) were intuitively placed by the Principal Investigator within potential impact areas using available site information and project plans. All BTUs were located in reference to available datums and placed on the project map [Fig. 2].

A total of 15 BTU's were excavated. The BTUs consisted of small trenches, approximately 5 feet/152.5 cm long and 24 inches/61 cm wide, mechanically excavated in approximately 20 cm "lifts" to culturally sterile subsoil or 5-6 feet (152/183 cm) below the present ground surface.

Each 20 cm lift was visually inspected for the presence/absence of cultural materials and sediment color and composition. Standard field records were maintained and photographs were taken as appropriate. No screening of the excavated sediment was undertaken and no sediment samples were collected. The north wall of each unit was sketch profiled and photographed. All of the BTUs were mechanically backfilled.

Testing Results

All units were located within the recorded CA-SCl-76 site boundary and excavated to depths ranging from approximately five to six feet (152/183 cm) below the present ground surface.[1] The soils belong to the Los Robles series and consist of well-drained clay loams underlain by stratified basic igneous rock alluvium. The typical Los Robles soil profile has a surface layer of dark brown neutral clay loam approximately nine inches (23 cm) thick. The subsoil is dark brown and brown, neutral clay loam and gravelly clay loam that is underlain at a depth of 58 inches (147 cm) by a yellowish-brown, neutral gravelly fine sandy clay loam (Lindsey 1974:24-25). The general stratigraphy and sediments are similar throughout the BTUs except for the presence/absence of the surface layer and generally conform to the published description of the Los Robles soil series (see Table 1 for a typical profile).[2]

No prehistoric or historic artifacts, ecofacts or culturally modified soils were observed either on the surface in the immediate vicinity of the BTUs or in the sediments excavated from the BTUs.

TABLE 1
TYPICAL PROFILE - UNITS 5 and 10, NORTH WALL

Surface Layer (when present): Dark greyish brown clay loam with grass, rootlets, etc. present
Average thickness: 9 inches (23 cm)
Range: 0.5-1.0 feet (12-25 cm)
Boundary between Surface and A: abrupt and straight

Stratum A: very dark gray (10YR 3/1) clay loam (surface organics present)
Average thickness: 3.5 feet (107 cm)
Range: 2.5-4.0 feet (76-122 cm)

---

1. Excavation at BTU 15 was stopped at a depth of two to three feet (61-91 cm) due to flooding and sidewall slumping.

2. At least two gross soil color and texture changes with depth were noted in all units except for BTU 15 which was abandoned after two to three feet of excavation due to flooding and slumping of the trench sidewalls. Layer 1, a dark brown "organic" stratum probably includes both the surface layer and subsoil noted for the Los Robles series. Layer 2, a yellow-brown stratum appears to represent the sediment underlying the Los Robles subsoil. The extremely high moisture content of the sediments masked the differentiation of any other layers and affected strata color differences. No sediment samples were collected.

Boundary between A and B: straight

<u>Stratum B</u>: dark yellowish brown (10YR 3/3 to 10YR 4/4) sandy clay loam
Average thickness: unknown
Range: unknown

Notes: Both A and B often had small fragments of decayed sandstone and other rock present (probably originating from several of the exposed Franciscan formations present on the surrounding hills).

SUMMARY

The lack of subsurface cultural materials resulted in a revision of the site boundary with the new southern perimeter placed just to the north of the proposed main access road for the Lion's Gate Reserve Project. The previous boundary determination had been based on the presence of isolated surface finds and an abbreviated, minimal auger testing. It is probable, based on the results of the current testing program, that the majority of CA-SCl-76 is present to the north of the proposed access road and is within the present ranch complex [Fig. 2].

REPORT REFERENCE: *Mechanically Assisted Site Testing Program at CA-SCl-76 For a Proposed Residential Project in Hayes Valley, South of Morgan Hill, Santa Clara County, California* (Colin I. Busby, Stuart A. Guedon, Melody E. Tannam and Donna M. Garaventa). MS on file, Basin Research Associates, San Leandro (March, 1996).

REFERENCES (conform to citations in above report)

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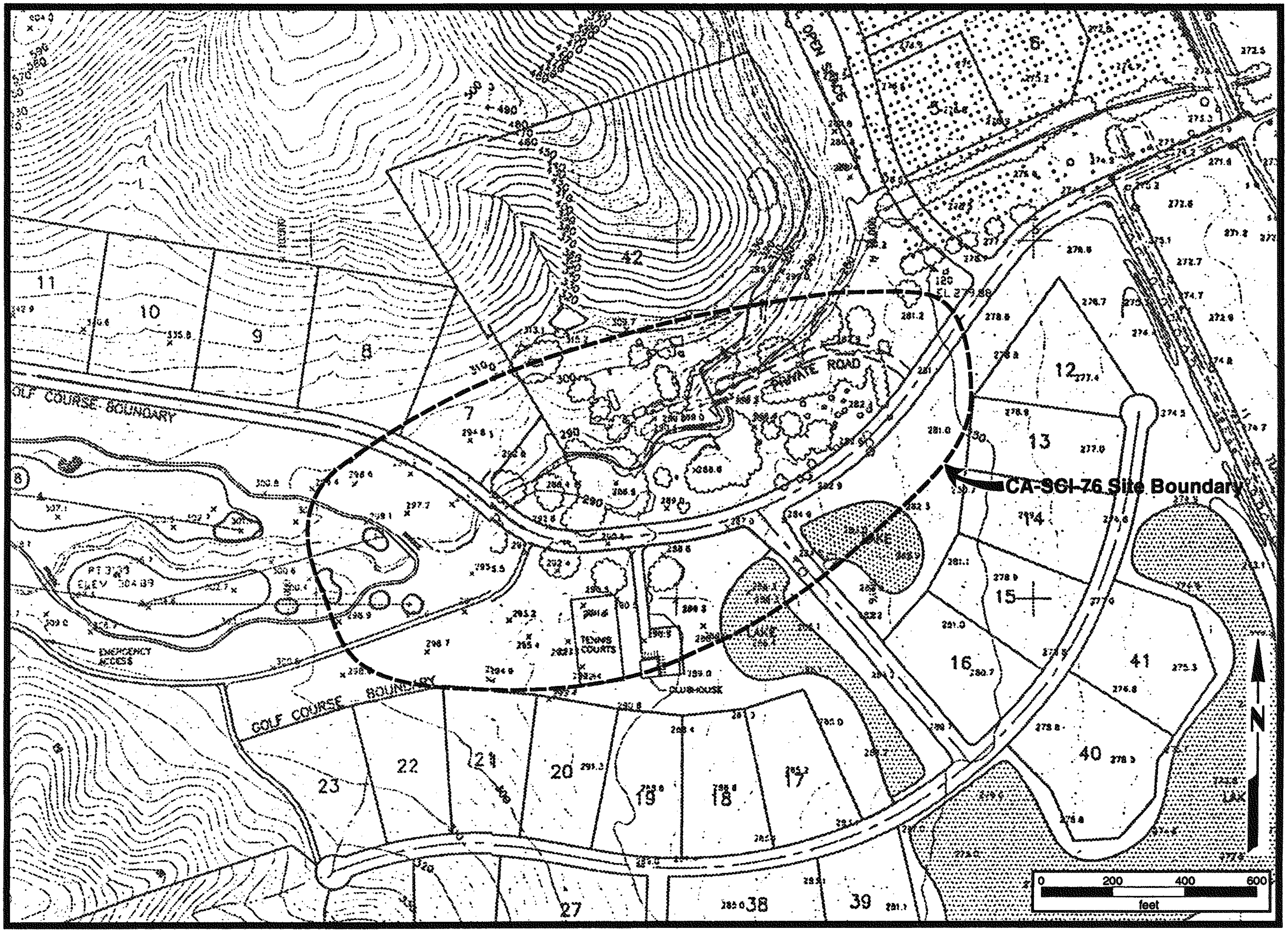


Figure 1: Proposed Development and CA-SCI-76 Site Boundary Prior to Subsurface Testing Program

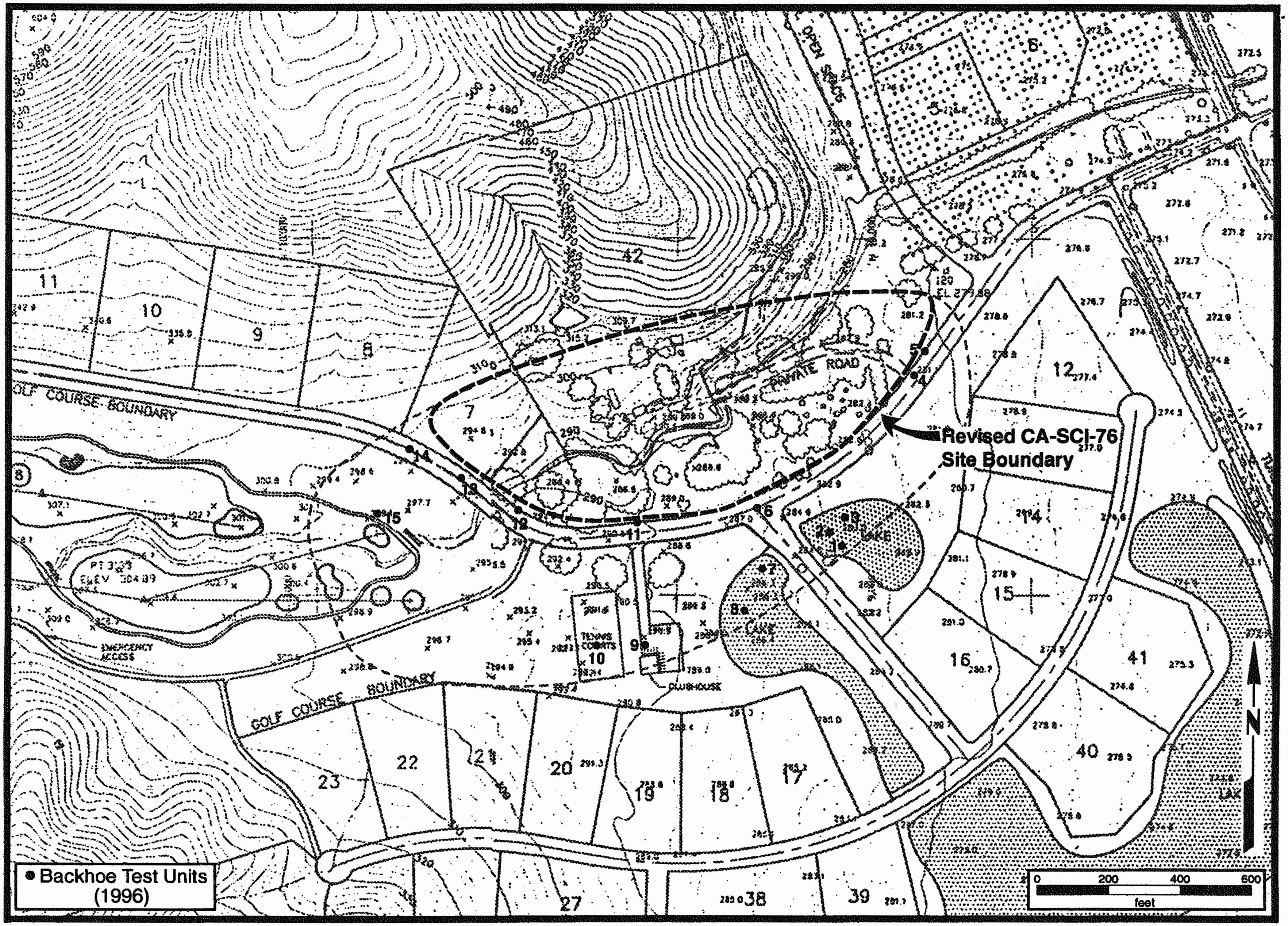


Figure 2: Proposed Development with Location of Backhoe Test Units and Revised CA-SCI-76 Site Boundary

SECOND ADDENDUM TO

ENVIRONMENTAL IMPACT REPORT

LION'S GATE RESERVE

(CordeValle)

LEAD AGENCY: COUNTY OF SANTA CLARA

File #4039-67-28-93
SCH #94043016

June 1998

TABLE OF CONTENTS*

* The contents only include sections of the EIR that have been revised in this Addendum.

INTRODUCTION

Description of Project Modifications

This Second EIR Addendum has been prepared to address the changes to the Lion's Gate Reserve (Cordevalle) project that have been proposed since the time that the EIR on the project was certified by the County Board of Supervisors in August 1996 and the first EIR Addendum was prepared in January 1997.

The main changes to the project addressed in this EIR Addendum include the following: 1) relocation and redesign of the clubhouse/overnight complex; 2) modifications to the golf course plan to accommodate the relocation of the clubhouse complex; 3) elimination of the previously proposed equestrian center and its replacement with a much smaller stable near the northeastern portion of the site; 4) changes to the boundaries of the golf course parcel and the cluster subdivision/permanent open space parcels resulting from the above project modifications, and 5) modification of the proposed on-site flood control facilities such that there would be a reduction in flood flows leaving the site during frequent storm events such as the 2-year event. These project changes are described in detail below, followed by a summary evaluation of potential impacts resulting from these modifications. The changes to the EIR resulting from these project modifications are addressed in the body of this addendum. It should be noted that there are two additional new project elements which are expected to be added in the future and which are not covered in this addendum. These include a future winery/grape processing facility and a water storage tank. These future facilities are briefly described below under 'Future Project Modifications'.

Clubhouse/Overnight Complex

The clubhouse facilities, overnight guest units, and associated parking area are now proposed to be located on the northern side of the West Branch of Llagas Creek instead of the south side as previously proposed. The size of the clubhouse facility has also increased somewhat and the layout and design of the complex has also been altered to be more low profile in character with greater separation among buildings. (The site plan and elevations for the redesigned complex are included in the EIR text portion of this Addendum.) The increase in floor area for the clubhouse has been necessitated largely because the original concept plan underestimated the space requirements for the various clubhouse functions. (A detailed floor area breakdown for clubhouses functions is provided in the text of this EIR addendum.) The number of overnight units remains the same at 45; however, the total floor area of guest units is actually slightly less than originally proposed due to a reduction in meeting room space. The parking area and planned drainage improvements for the complex and parking area are also to be modified, and the total number of parking spaces has increased.

The larger overall land area required for the complex has increased for several reasons including: the clubhouse facilities are now largely planned for one main floor instead several stories as originally proposed; the guest units are now planned to consist entirely of single story units instead of the two-story buildings as originally planned; the separation among buildings has increased to create a campus-like setting; the overall square footage of the clubhouse has increased, and; the increase in parking spaces has resulted in a larger area devoted to parking.

The main changes resulting from the relocation and reconfiguration of the clubhouse/overnight complex are summarized in the table below. This table shows figures from the certified EIR (July 1996), as well as figures reflecting the design first approved by the Architectural and Site Approval Committee (ASA) in June 1997, in addition to the currently proposed changes to be considered by ASA on June 11, 1998.

	EIR (7/96)	1st ASA (6/97) (approved)	2nd ASA (6/98) (proposed changes)
Clubhouse/Overnight and Parking Acreage	6.3 acres*	15.6 acres	19.1 acres
Clubhouse Complex Floor Area	29,170 sf	±45,000 sf	55,100 sf**
Overnight Complex Floor Area	34,000 sf	±41,000 sf	32,500 sf
Parking Spaces	250	320	350

* Did not include parking area at driving range.
** Includes 3,200 sf freestanding pro shop.

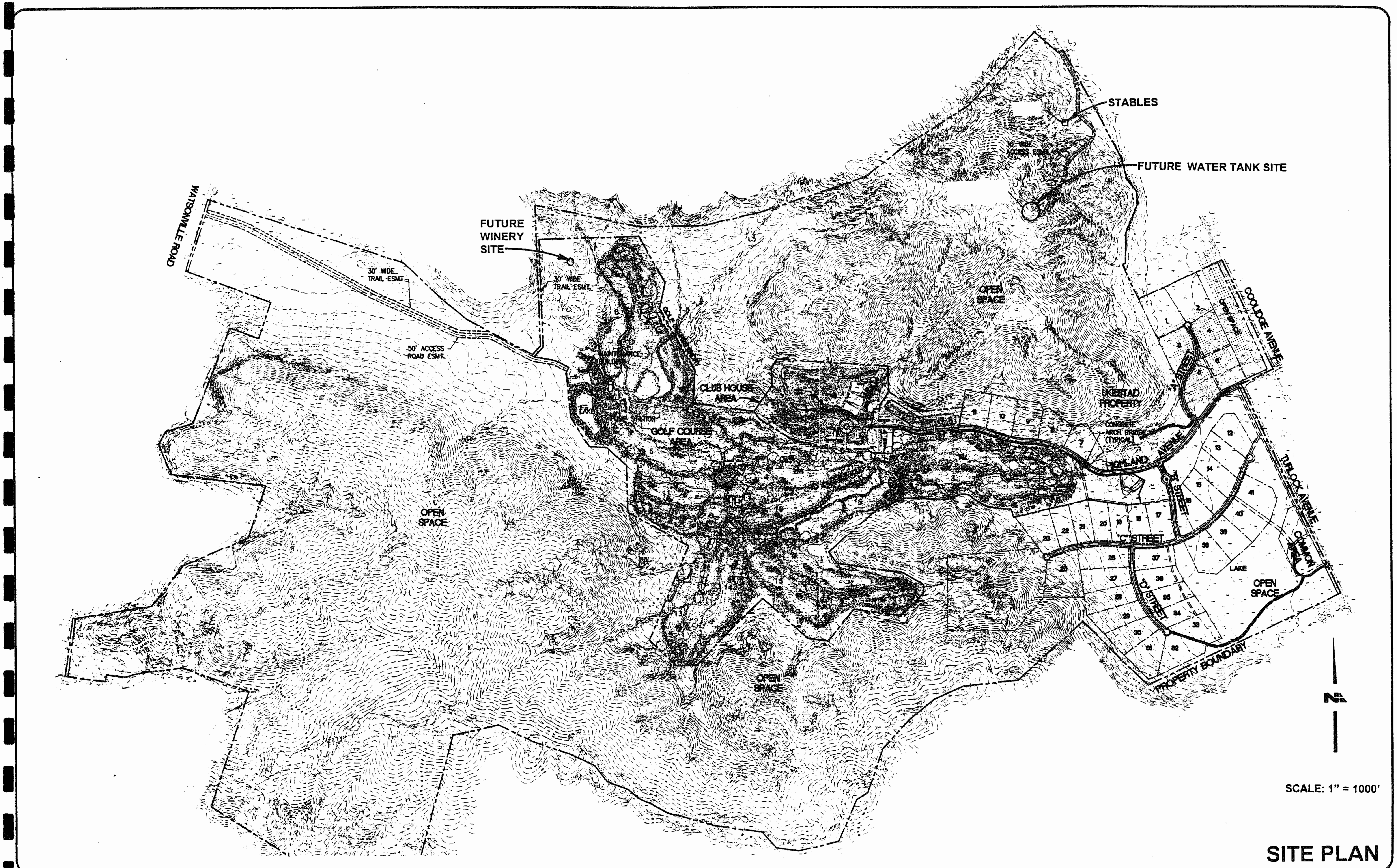
The new clubhouse location is preferred by the applicant because it provides more land area for the facilities, thus allowing for a less intense building pattern. The new site has better sun exposure with its southward orientation, and it also offers better views of the golf course and Lion's Peak, as well as better protection from the wind. The new clubhouse/overnight complex site is located to the south of a series of low ridges and hills where it is completely screened from view from off-site locations. The new site avoids the use of retaining walls, and also avoids the landslide on the adjacent hillside to the south, which required a geotechnical engineering solution for the previous clubhouse location. The clubhouse/overnight complex will be sited a minimum of 75 feet from the main creek channel and the tributary channel to the east. The new location allows the parking area to be consolidated into a single location north of the main access road, and allows siting of the parking area closer to the clubhouse area. The new parking lot location is several hundred feet from the main creek channel and 75 feet from a tributary channel at its nearest edge. No tree removal is required at the new clubhouse location.

The proposed location of the complex on the north side of the creek also eliminates the need for a vehicle bridge across the creek, as well as crossings by sanitary sewer and utility lines. The County Fire Marshal's office has indicated that the new location and configuration for the clubhouse/overnight complex is preferable to the previous plan because the shorter length of the access road would improve response times, the less steep slope of the fire access route to the overnight units improves accessibility, and the generally better accessibility of single-story structures compared to multi-story buildings proposed previously.

The new location of the clubhouse complex is partially in an area that was previously planned for golf course fairways. The necessary adjustments to the golf course plan resulting from the clubhouse relocation are described below.

Golf Course Modifications

Several changes to the proposed golf course layout have been made to accommodate the relocated clubhouse and overnight complex. The original hole #7 was eliminated to make way for the clubhouse which resulted in several adjustments to the layout and routing of the golf course, including some changes in golf hole numbering. To replace hole #7, a new hole (#2) is planned near the eastern end of the golf course along the south side of the main access road. The new hole #2 does not cross the main creek channel as the old hole #7 did, and thus results in fewer potential impacts to the creek. In addition, hole #18 was lengthened by extending it into the former clubhouse site. The old 18th hole drainage swale and lake were replaced by a broader and deeper swale that runs down the length of the left side of the hole and discharges over a weir into the creek. In the revised plan the retention basin has been moved westward to the north side of the 11th hole. The external boundaries of the golf course parcel were also moved inward in several places including the former site of the overnight units,



Source: PACE Engineering

the area west of the 13th hole and south of the irrigation reservoir, and the north edge of driving range (which has been substantially reduced in area).

As a result of the above modifications, the overall acreage of the golf course parcel (which includes the clubhouse/overnight complex) increases from 270 acres to 277 acres. The areas of boundary expansion occur at the currently proposed location of the overnight complex and at the site for a new winery/grape processing facility proposed near the northwestern edge of the golf course (see 'Future Project Modifications' below. These expansions are largely compensated by the golf course boundary contractions noted above, such that the net increase in acreage for the golf course parcel is 7 acres (270+7=277). The modifications to the golf course plan result in environmentally beneficial changes such as reduction of number of holes crossing the main creek channel from 3 to 2, and a reduction in overall tree removal from 18 to 16.

The refinements to the golf course design have also resulted in an increase in overall earthwork quantities. The total volume of cut has increased from 344,390 cubic yards (cy) in the EIR to 414,650 cy under the current grading plan, and the total volume of fill has increased from 269,900 cy in the EIR to 387,900 cy under the current plan. These grading increases have been necessitated by the following design changes: additional fills needed to elevate the tee and green sites; additional grading at the practice facility/driving range to provide flatter grades at the tee boxes and smoother slope transitions throughout; changes to the drainage plan along the 18th hole to provide a more naturalistic surface drainage pattern instead of underground pipes, and; deepening of the irrigation lake to provide additional storage capacity. As originally proposed, cuts and fills would be balanced on-site.

Elimination of Equestrian Center and Replacement with a Small-Scale Stable

The original project proposal evaluated in the EIR included a full equestrian center on 12.8 acres in the southeast corner of the project site. As described in detail in the EIR, this was to have been a 40,000 square facility with space for up to 30 horses, a covered riding arena, living quarters for a caretaker/manager, an outdoor riding ring, a training area/paddock and pasture, a paved access road and parking area, and an on-site retention basin to capture runoff from the site. The applicant proposes to eliminate the equestrian center from the project. In its place, a small stable large enough for up to 10 horses is planned for the northeast corner of the site, where it would be removed from the residential subdivisions and yet provide convenient access to the on-site riding trails. The stable would have a floor area of up to 4,000 square feet and would occupy 1 to 2 acres, which includes the stalls plus a small storage area for hay, and an adjoining area for corrals. The stable would have an informal rustic design to fit in with the rural surroundings. The stable is intended solely as a place for homeowners of the project to keep their horses and would not include the other facilities previously proposed for the equestrian center.

Boundary Modifications to Golf Course and Permanent Open Space Area

The land use modifications discussed above result in changes to the boundaries of the golf course parcel and the permanent open space area. As discussed above, the expansion of the clubhouse/overnight complex and the future addition of the winery/processing center would result in a net increase of 7 acres in the westerly portion of the golf course parcel. In addition, minor modifications made to the cluster subdivision plan since the EIR was certified in July 1996 has resulted in an expansion of the residential cluster subdivision by 11.2 acres. Also, the wastewater treatment plant added in 1997 (see EIR Addendum of 1/97) occupies a 5.3-acre common area that was originally within the permanent open space area. The net effect of these modifications is a 24-acre reduction of the permanent open space area (from 1,265.7 acres to 1,241.7 acres). As shown below, this reduced open space area still comprises sufficient land area to comply with the 90 percent open space requirement applicable to the hillside cluster subdivision.

	Acreage per EIR (7/96)	Current Acreage
Golf Course	269.5	277.0
Rural Residential	31.5	31.5
Common Area (WW facility)	--	5.3
Hillside Cluster		
Residential	102.8	114.0
Main Access Road	6.5	6.5
Permanent Open Space	1,265.7	1,241.7
Total Site	1,676.0	1,676.0

Hillside Cluster Parcel	
Total Acreage	1,362.2 acres
Permanent Open Space Required (@ 90%)	1,225.9
Permanent Open Space Provided	1,241.7
Excess Permanent Open Space	15.8 acres

Flood Control Improvements

The changes proposed to the project plans include modification of the proposed on-site flood control facilities. In general, these flood control modifications would provide for a substantial reduction in flood flows leaving the site during more frequent storm events such as the 2-year storm. These improvements would also result in significant reductions in the 100-year and 10-year flows compared to the previously proposed flood control improvements.

The main features of the modified flood control plan are the creation of a diversion channel to parallel the existing West Branch of Llagas Creek at the east end of the project, and the diversion of flood flows carried by the creek and the diversion channel to a 5-acre detention basin alongside Coolidge Avenue north of Highland Avenue. The residential lake south of Highland Avenue would provide detention storage for the adjacent residential area and tributary uplands only. Under the previous plan, a substantial portion of the flood flows carried by the West Branch of Llagas Creek during the 100-year and 10-year events were to have been diverted to the residential lake. This would have provided a significant improvement over existing conditions for these events, but would not have provided reductions in downstream flooding during the more frequent storm events like the 2-year storm, as proposed under the current plan. (The proposed flood control improvements are described in detail in Section *IV. E. Hydrology and Drainage*.)

Future Project Modifications

In addition to the project modifications described above, two new components are expected to be added to the project in the future, which are not described above. These include the following:

1) A 400,000 gallon water storage tank proposed for the northeastern portion of the property which would provide for adequate fire flows to the project and to the neighboring residential areas to the east;

2) A winery/grape processing center which would provide on-site processing for grapes grown in the western portion of the site in accordance with County agricultural mitigation requirements for the project.

The winery/processing center would be located in the northwest portion of the site north of the golf course maintenance facility and would not be open to the public. The winery site consists of land currently allocated to permanent open space which would be removed from permanent open space and included in an expanded golf course parcel. However, as shown above there is sufficient 'surplus' permanent open space area in the project plan that this reduction would not result in the ratio of permanent open space falling below the 90 required for the hillside cluster subdivision.

This EIR Addendum is not intended to provide environmental clearance for the water tank or the winery/processing center. Since these project elements will require individual use permit applications which have not yet been submitted, it is premature to conduct environmental review for these facilities at this time. However, an informal environmental review indicated that these facilities would not result in potentially significant impacts. Therefore, a subsequent EIR addendum will be prepared on these new project components in conjunction with the use permit application process.

Summary Evaluation of Potential Impacts Resulting from Project Modifications

The proposed modifications to the Lion's Gate/CordeValle project would not result in any new significant environmental impacts and in some instances would result in beneficial environmental effects compared with the project evaluated in the EIR. The environmental effects of the project modifications are briefly evaluated below.

Land Use: The increased floor area and land coverage of the clubhouse/overnight complex results in a slight increase in the project's land use intensity. The revised complex would result in an approximately 5 percent increase in impervious surface coverage relative to the project evaluated in the 1996 EIR. However, the overall building intensity is still extremely low, with built and paved surfaces occupying approximately 6 percent of proposed development area and 1.5 percent of the entire project site. Therefore, the proposed increase in building area does not represent a significant impact. No changes are required to EIR Section *III. A. Land Use.*

Parks, Recreation and Open Space: The project modifications result in a reduction of permanent open space from 1,265.7 to 1,241.7 acres. This 2 percent reduction does not represent a significant impact, and the total open space allocation still exceeds the 1,226 acres required to fulfill the 90 percent open space requirement for the Hillside cluster subdivision. EIR Section *III. C. Parks, Recreation and Open Space* has been amended accordingly.

Geology and Soils: The relocation of the clubhouse/overnight complex to the north side of the creek removes it from the potential landslide hazard that exists at the originally proposed site. The currently proposed site is not subject to landslide hazard. The new site is traversed by an inactive fault trace; however, any potential hazard associated with the trace can be mitigated by overexcavation and recompaction of foundation soils over the fault trace, or by deep foundations such as drilled shafts or driven piles, or by modifying the location of structures away from the fault trace. (This is addressed in detail in the geologic report prepared by Twining Labs in May 1998, which is contained in Appendix C of this EIR Addendum.) EIR Section *III. D. Geology and Soils* has been amended accordingly. All other geologic and soils conditions at the new clubhouse site are essentially the same as those at the previously proposed clubhouse site.

Hydrology and Drainage: The proposed flood control modifications would provide for a substantial reduction in flood flows leaving the site during more frequent storm events such as the 2-year storm. These improvements would also result in significant reductions in the 100-year and 10-year flows compared to the previously proposed flood control improvements. The environmental effect would be beneficial relative to the improvements evaluated in the 1996 EIR. Section *III. E. Hydrology and Drainage* has been amended accordingly. The Master Drainage Plan prepared by PACE Engineering which describes and evaluates the flood control modifications is contained in Appendix D of this EIR Appendix.

Water Quality: The removal of the equestrian center from the plan would avoid the creation of potentially contaminated runoff from the center. Although the equestrian center plan provided for isolation of the center from the surrounding drainage area and included an exclusive retention basin to capture runoff, the elimination of the center is environmentally beneficial in terms of potential water quality impacts. The smaller stable now proposed for the northeastern portion of the site would be managed in accordance with County and state requirements to prevent water quality impacts from this facility.

Surface drainage from the relocated and redesigned clubhouse parking lot will be conveyed to underground drains in the adjacent golf course and passed through a biofilter prior to discharge into West Branch Llagas Creek. The previous proposal was to convey discharge to adjacent retention basins. The net effect on water quality would be about the same under the previous and current proposals. EIR Section *III. E. Water Quality* has been amended to reflect the above.

Biological Resources: The revised site plan has been evaluated by H.T. Harvey and Associates. The biologists surveyed the new site for the clubhouse complex and the new stable site and found no sensitive species or habitats that would be affected by these project modifications. Therefore, the proposed modifications would result in no new potential impacts to biological resources. No changes are required to EIR Section *III. F. Biological Resources.* The letter report prepared by Harvey and Associates which addresses the project modifications is contained in Appendix F of this EIR Addendum.

The revised golf course routing plan results in a reduction of fairways crossing the main creek channel from 3 to 2. This will tend to reduce the incidence of golfers entering the creek channel (against course rules) to retrieve errant golf balls, and as such would reduce impacts to riparian habitat.

The revised golf course plan results in a reduction of overall tree loss from 18 to 16 trees, which represents a beneficial effect of the revised plan.

Archaeology: The new location for the clubhouse complex and the new stable site are not within areas of archaeological sensitivity and there are no known archaeological resources in the vicinity of these sites. The western end of the bypass channel along Highland Avenue at the project entrance is in close proximity to recorded archaeological site CA-SCl-76. As such, work at the western end of the bypass channel would be subject to monitoring provisions specified in the EIR. None of these changes necessitate modification of EIR Section *III. E. Archaeology.* A letter report on the project modifications prepared by Basin Research Associates is contained in Appendix G of this EIR Addendum.

Aesthetics: At the new location north of West Branch Llagas Creek, the nearby hills completely shield the clubhouse and overnight complex from view from off-site locations, including the residence overlooking the site from the off-site ridge to the north. If anything the clubhouse complex would be better shielded from view by the intervening hills. The new stable in the northeast portion of the site may be visible from existing residences to the east, but it would be small in scale and have an informal rustic appearance that would blend in with its rural surroundings. The potential visual effects of the proposed flood detention basin adjacent to Coolidge Avenue would be mitigated by the landscaped berm planned along the roadway frontage. Therefore, the project modifications would not result in new or increased visual impacts. EIR Section *III. J. Visual and Aesthetics* has been modified to reflect the above.

Traffic: The larger clubhouse proposed would generate additional traffic since the restaurant component increases in size from 4,000 square feet to approximately 5,800 square feet. An evaluation of the project changes by TJKM Transportation Consultants estimated that total p.m. trip generation from the project would increase by 15 trips as a result of the larger restaurant component. The other modifications would not result in increased trip generation. It was calculated that this additional trip generation would have no effect on levels of service or average vehicle delay at any of the potentially affected intersections. Therefore, the project modifications would have no traffic impacts. No changes are required to EIR Section *III. K. Traffic and Circulation*. The letter report by TJKM that addresses the project changes is contained in Appendix H of this EIR Addendum.

Noise: The relocation of the clubhouse to the north would bring this facility closer to the existing residence on the northern ridge overlooking the site. The new clubhouse location is 3,000 feet from this residence while the original clubhouse location was 3,600 feet away. The analysis in the 1996 EIR concluded that loud music played at the clubhouse during weddings or similar events may be audible at the existing residence under certain conditions but would not result in significant noise impacts. The new clubhouse location was evaluated by Illingworth & Rodkin who concluded that the new location would result in noise levels 2 decibels louder than at the previous site, but that the resulting noise levels would be within the range indicated in the EIR. The new clubhouse location would not result in noise impacts to the existing residence. The letter report by Illingworth & Rodkin that addresses the noise impacts of the project changes in contained in Appendix I of this EIR Addendum.

One of the golf course modifications involves the siting of a new hole (#1) along the south side of the main access road, just south of several planned lots for rural residential dwellings. The new hole would result in fairway mowing at a distances as close as 120 feet from these future residences, compared with a minimum distance of 200 feet under the previous plan. This will result in mower noise being louder at the residences than under the previous plan. However, the County noise ordinance allows for noise sources to exceed County standards if the duration of the noise is limited as prescribed in the ordinance. There is not expected to be any difficulty in meeting these time restrictions. Therefore, this project modification would not result in a significant noise impact. EIR Section *III. L. Noise* has been amended to reflect the above.

Air Quality: The slight increase in traffic generated as a result of the larger restaurant component proposed for the clubhouse would also increase the generation of vehicle emissions. However, according to air quality consultant M'OC Physics Applied, this increase would not be significant in terms of either local carbon monoxide concentrations or in term of pollutants of regional concern. No changes are required to EIR Section *III. M. Air Quality*.

Hazards: The removal of the equestrian center from the plan reduces the concern for potential vector and odor impacts. Although similar issues arise for the new stable, the potential for impacts is much reduced due to the smaller scale of the stable. EIR Section *III. N. Hazardous Materials, Public Health and Safety* has been amended to reflect the above.

Rationale for Preparation of an EIR Addendum

This document has been prepared in accordance with the requirements of the California Environmental Quality Act (CEQA) which sets forth specific requirements for the documentation of potential environmental impacts which may result from modifications made to a proposed project after an EIR on the project has been certified. Under these circumstances, Sections 15162 through 15164 of the CEQA Guidelines provide for the preparation of one of three types of documents depending on the situation. The criteria to be met for each type of document are as follows: 1) a 'Subsequent EIR' shall be prepared if the changes to the project are substantial, and will result in major revisions to the EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; 2) a 'Supplement to an EIR' shall be prepared if the conditions described in #1 above apply but only minor changes or revisions to the EIR are necessary; and 3) an 'Addendum to an EIR' shall be prepared if some minor changes and additions are necessary, but the conditions which would necessitate the preparation of a Supplement to an EIR are not present. In the present case, the proposed modifications may or may not be considered substantial, but the overall effect of the changes would be beneficial environmentally, and in no instance would new significant environmental effects be involved or the severity of a significant effect be increased substantially, as discussed above and in the body of this document. In addition, the changes to the EIR required to address the proposed project modifications are minor in nature. Thus two of the required criteria for preparing a Subsequent EIR and one of the required criteria for preparing a Supplement to an EIR would not apply. Therefore, according to CEQA criteria noted above, the type of environmental document that should be prepared in this instance is an 'Addendum to an EIR.'

Organization of This Document

Since this is the Second Addendum to the EIR, this document identifies revisions to the certified EIR, as modified by the first Addendum, which reflect the changes in project description and environmental analysis resulting from the proposed modifications to the project. In order to facilitate the reader's comprehension without having to refer back to the certified EIR and the first Addendum, this document contains the affected portion of the EIR to provide a context for the text changes. Revisions to the text are indicated by ~~strikethrough~~ for deletions and <u>underline</u> for additions.

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SUMMARY OF IMPACTS AND MITIGATIONS

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D. GEOLOGY AND SOILS

IMPACT	MITIGATION
1. Potential secondary ground rupture or sympathetic movement along inactive faults crossing the site may result in minor damage to structures, roadways and utility lines. **(Potential Significant Impact)**	1. Where proposed structures for human occupancy are determined to be underlain by an inactive fault trace, mitigation could consist of modification of the soil foundation, using deep foundations, or modifying the location of the structure away from the shear zone. ~~Appropriate setback distances from these structures may be required.~~ **(Less-than-Significant Impact with Mitigation)**

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E. HYDROLOGY AND DRAINAGE

IMPACT	MITIGATION
1. The project would potentially result in increased downstream flooding during the 100-year and 10-year storms. **(Potential Significant Impact)**	1. ~~The on-site lake proposed for the southern residential cluster subdivision would be designed to provide sufficient detention storage for increased peak runoff resulting from site development. In addition, a diversion structure would be constructed in the creek channel to divert a substantial portion of the flows exceeding the existing 10-year flow rates to the residential lake, which would be sized to accommodate flows from the 100-year event. With these facilities, the peak flow rates leaving the project site during significant storm events would be substantially lower than under existing conditions.~~ In order to control and detain flood flows generated at the site, a diversion channel, a detention basin and a lake are proposed. These structures would be designed to minimize the extent of flooding within the project boundaries, and would reduce peak flood flows leaving the site during the 100-year, 10-year, and 2-year events relative to existing conditions. **(Less-than-Significant Impact with Mitigation)**

IMPACT	MITIGATION

E. HYDROLOGY AND DRAINAGE (CONT'D)

2. Portions of the residential cluster subdivisions and the wastewater treatment facility ~~would~~ may be subject to shallow flooding (one-foot average depth) during a 100-year event, and the proposed structures could also partially obstruct this sheet flow through the site. However, the total area of the site that may be subject to shallow flooding would be reduced by flood control improvements included in the project.
(Potential Significant Impact)

2. Potential impacts to the residential subdivisions and the wastewater treatment facility from shallow flooding would be mitigated by constructing building pads on fills raised above flood elevations. The partial obstruction of shallow overland sheet flows by the proposed development would be mitigated by balancing fills with cuts within the flood-prone areas.
(Less-than-Significant Impact with Mitigation)

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L. NOISE

5. Noise levels would be temporarily elevated during grading and construction.
(Potential Significant Impact)

5. Short-term construction noise impacts would be reduced through compliance with the County's Noise Ordinance with respect to hours of operation and maximum noise levels at adjacent property lines. At the eastern edge of the project, the berms proposed along the project boundary would be constructed during the early phases of grading to provide a noise barrier for existing residences nearby.
(Less-than-Significant Impact with Mitigation)

I. PROJECT DESCRIPTION

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B. DESCRIPTION OF THE PROPOSED PROJECT

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Cluster Residential Subdivisions

The project would include two main residential clusters and related open space areas, as described below.

Rural Residential Cluster Subdivision

The 31.5-acre Rural Residential parcel is located at the eastern edge of the site, adjacent to Coolidge Avenue, north of Highland Avenue. The proposal is to cluster the 6 permitted lots in the western portion of this parcel, with lots ranging in size from 1.7 to 2.5 acres. The eastern and southern edges of the site would remain in permanent open space. The old plum and walnut orchard would be removed and replaced with a 4 foot high

TABLE 1

PROPOSED LAND USES

Land Use	Acreage
Golf Course	
• Open Area	~~263.2~~ 239.9
• Clubhouse, Overnight Facilities & Parking	~~6.3~~ 19.1
• Winery Site	18.0
Residential	
• Hillside Cluster	~~102.8~~ 114.0
• Rural Residential Cluster	31.5
Permanent Open Space	~~1,265.7~~ 1241.7
Main Access Road	6.5
Common Area (Wastewater Treatment Facility)	5.3
TOTAL	1,676.0

landscaped berm along the roadway.~~, and a vineyard of approximately 10 acres would be planted behind the berm. This buffer area would range in depth from 250 to 400 feet, comprising a total of approximately 12 acres.~~ Just west of the berm, a detention basin would be excavated to provide flood storage during major storm events and reduce downstream flooding. The southern portion of this site would contain the channel of West Branch Llagas Creek, which flows from west to east alongside Highland Avenue. To prevent flooding along the banks of the creek through this area, a diversion channel would be created which would run parallel and to the south of the creek channel (see 'Drainage' below).

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Permanent Open Space

The Hillside cluster subdivision would include a ~~1,265~~ 1,242-acre permanent open space area which would constitute over 90 percent of the Hillside zone on the site. (This ~~assumes that~~ includes the 259 acres ~~currently~~ formerly designated "Agriculture - Medium Scale" in the County General Plan ~~would be~~ that were redesignated to "Hillsides.") Most of this permanent open space area comprises the hillside areas which flank Hayes Valley on the north and south, and also includes the level pasture land in the western portion of the site near Watsonville Road. This area would include a system of informal trails for hiking and horseback riding.

~~A small portion (less than one acre) of the northern hillside area adjacent to the golf course driving range would provide the site for winter storage of treated effluent prior to spray irrigation on the driving range.~~

The permanent open space area would include a public trail easement for the proposed San Martin Cross-Valley Trail, which would follow the northern boundary of the site. The trail would be constructed by the County of Santa Clara Department of Parks and Recreation.

The permanent open space area would also include 100 acres of vineyard to be planted ~~in two areas. A 10-acre vineyard would be planted along Coolidge Avenue, within the 250-foot setback area for the proposed Rural Residential subdivision. A 100-acre vineyard would be planted~~ at the western end of the project, in the open field fronting onto Watsonville Road.

The permanent open space area also includes an area of approximately ~~40~~ 35 acres in the southeastern corner of the site. This area would include: buffer areas around the residential lots, a 4-foot landscaped berm along Turlock Avenue, and a 20-acre lake. ~~and a 20-acre equestrian center (see 'Drainage' and 'Equestrian Center' below).~~

The permanent open space areas of the site would be placed in the ownership of the Homeowners Association for the project, and would not be open to the general public, except for the public trail easement described above. The grazing of cattle on the Lion's Gate site (which currently reaches a peak of 250 head) would be discontinued upon construction of the project.

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Golf Course

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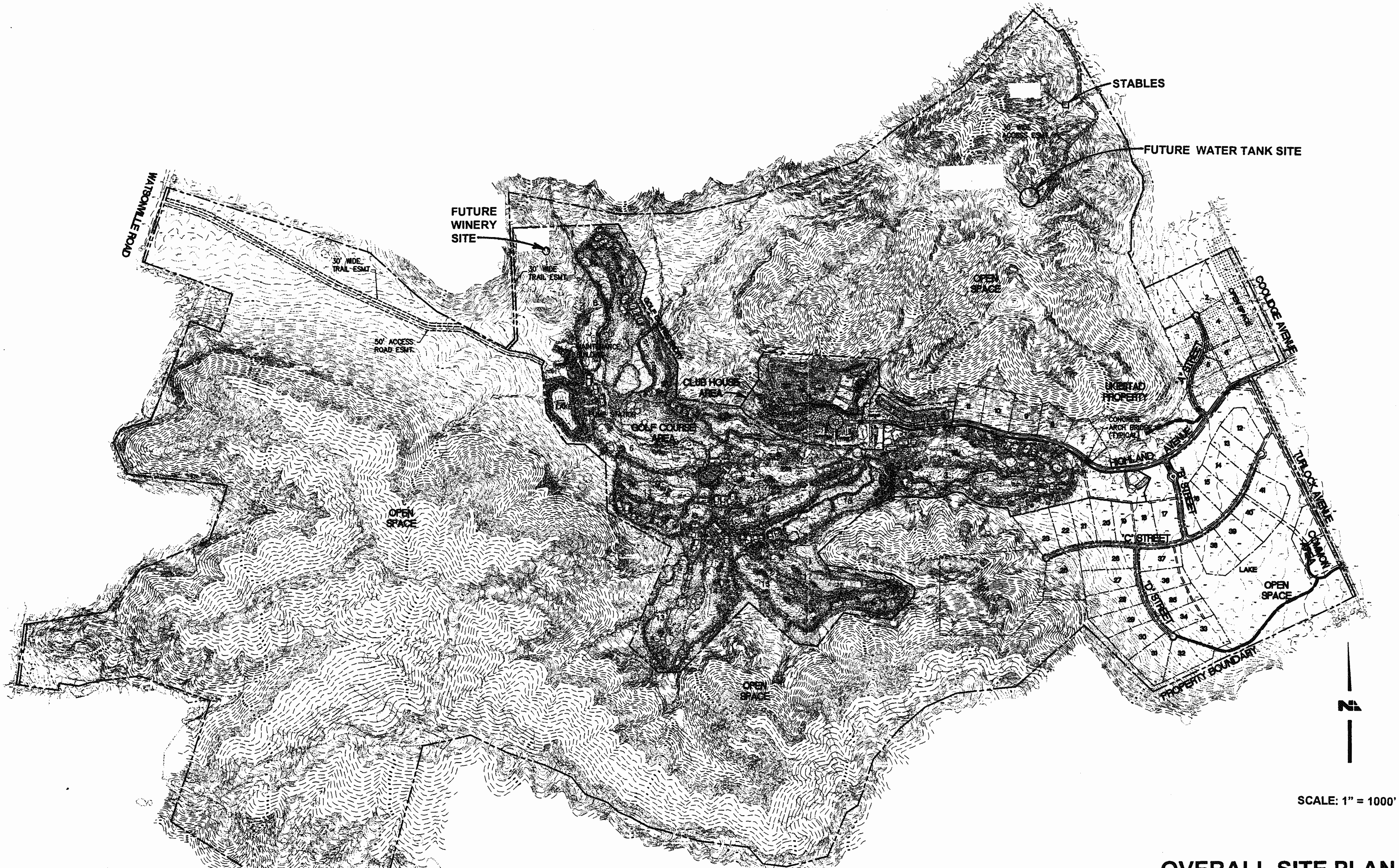
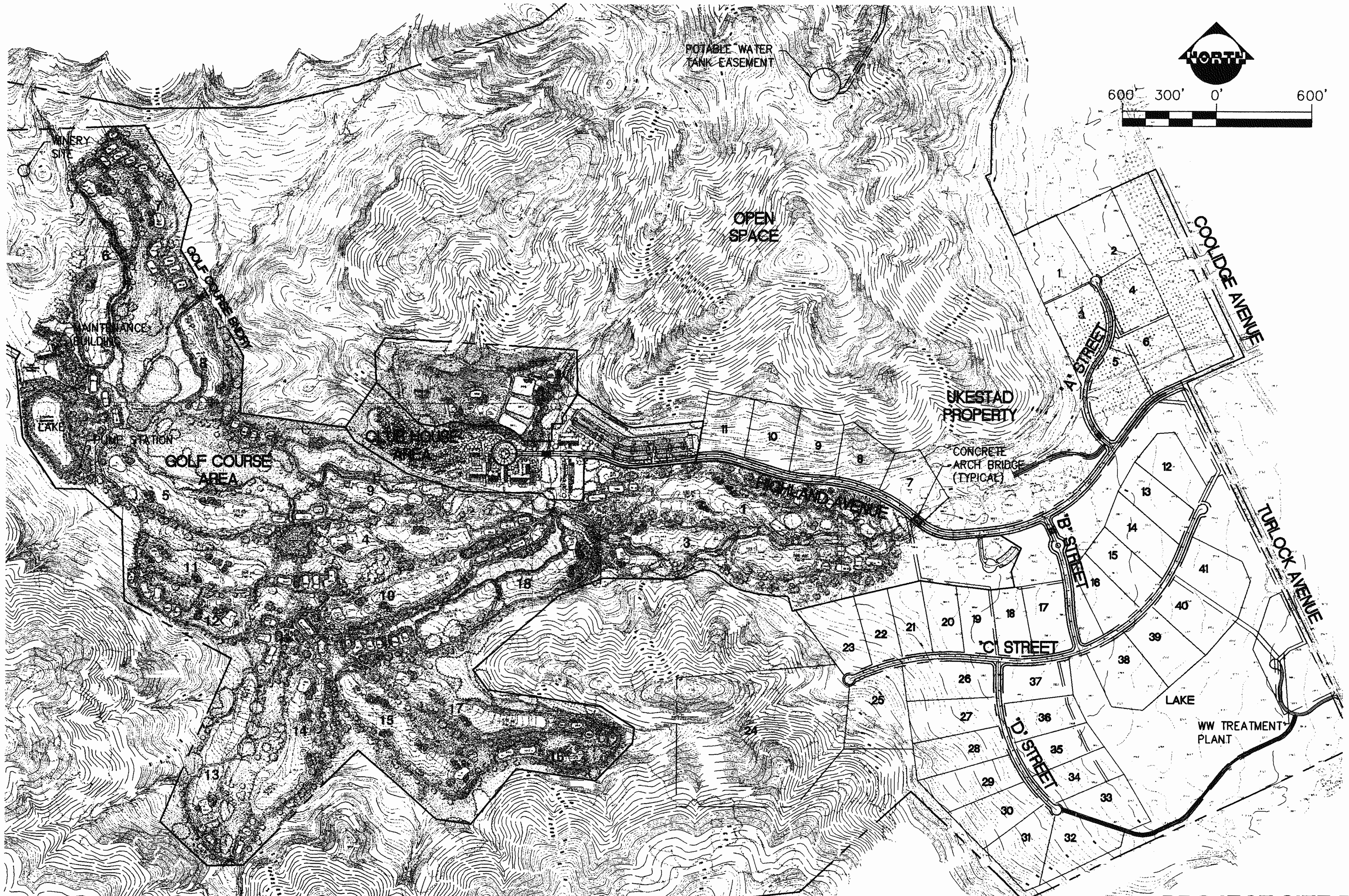
The total quantity of earth to be moved during grading for the golf course and related facilities is estimated to be approximately ~~one million~~ 760,000 cubic yards. A total of ~~18~~ 16 trees would require removal to accommodate the golf course. These would be replaced by over 2,500 native trees to be planted throughout the golf course and the residential areas of the project. (These are trees that have been specifically grown for the project from acorns and seeds collected from the site in 1989.)



OVERALL SITE PLAN

FIGURE 9a

Source: PACE Engineering



PROJECT SITE PLAN

Source: PACE Engineering

FIGURE 9b

TABLE 2

PROJECT SUMMARY DATA

RESIDENTIAL	
• Rural Residential Cluster Subdivision (lots)	6
• Hillside Residential Cluster Subdivision (lots)	35
GOLF COURSE	
• Holes	18
• Clubhouse (square feet - includes pro shop)	~~29,000~~ 55,100
• Overnight Accommodations (units)	45
• Parking Spaces (Clubhouse, Overnight, Practice Facilities)	~~250~~ 350
• Maintenance Facility (square feet)	6,000
Grading (cubic yards - cut/fill)	~~500,000/500,000~~ 575,000/527,000
Tree Removal (total)	~~18~~ 16
Tree Planting	2,500+
WATER CONSUMPTION (gallons/day) - (average/peak)	
Golf Course Irrigation (non-potable)	334,000/677,000
Domestic/Landscape/Washdown	57,000/114,000
WASTEWATER FLOWS (gallons/day) - (average/peak)	23,000/30,000

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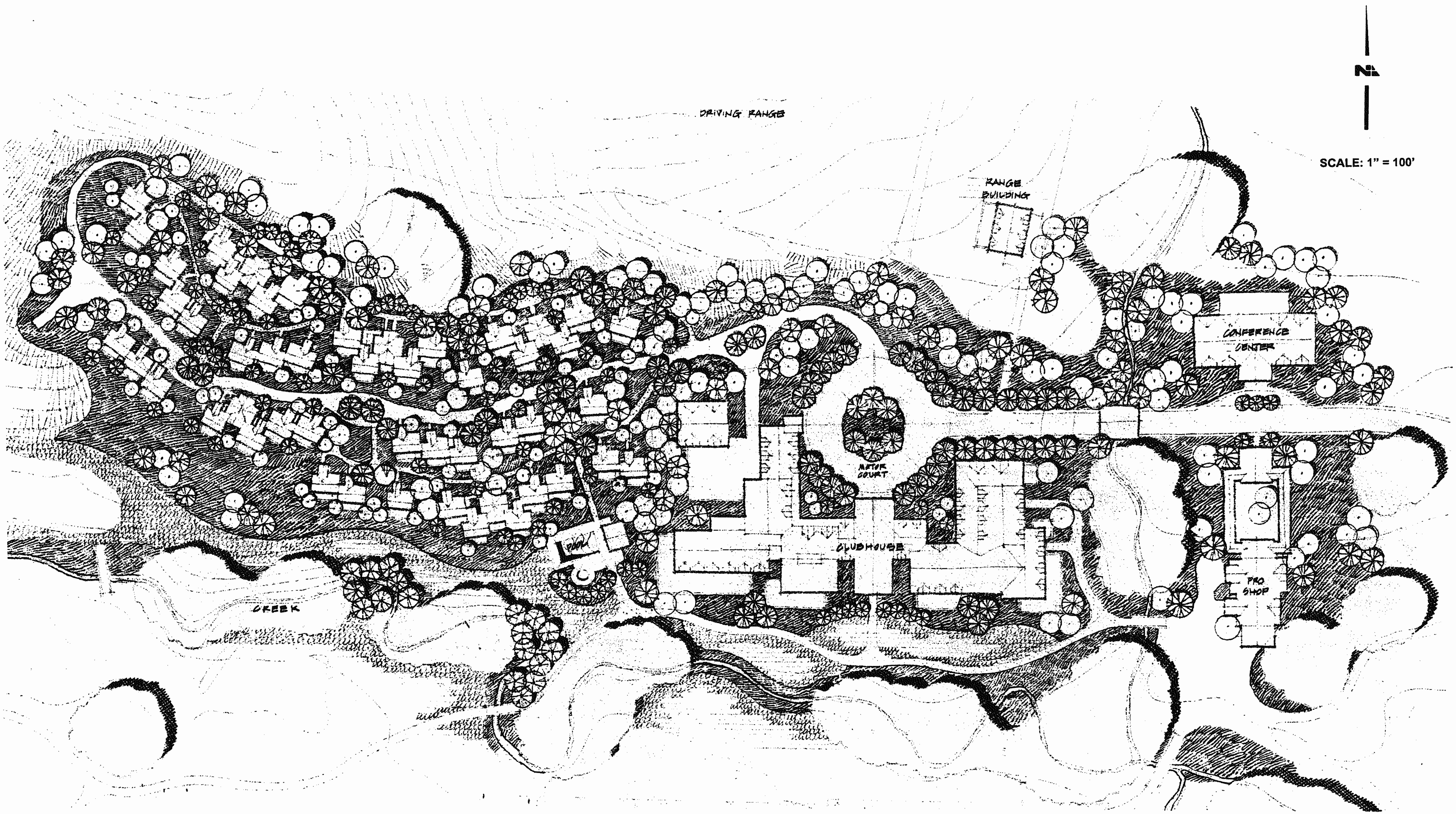
Clubhouse

The focal point of the golf course would be a ~~3-level 29,000~~ 55,122 square-foot clubhouse (inclusive of the ~~golf card barn~~ pro shop) and 45 units of overnight accommodation. This complex is proposed for the ~~foot of the southern hillsides~~ north side of West Branch Llagas Creek in the east-central area of the site (see Figures 10a and 10b). The floor area breakdown for the clubhouse is provided in Table 3.

TABLE 3 (Revised)

CLUBHOUSE FLOOR AREA BREAKDOWN

Function	Floor Area (Square Feet)	Function	Floor Area (Square Feet)
Main Floor		Upper Level	
Dining Rooms & Mixed Grill	5,840	Staff Locker Rooms	1,600
Bar	640	Staff Lounge	850
Kitchen	2,336	Meeting Rooms	2,520
Main Hall	2,496	Pre-function	1,000
Front Desk & Reception	1,040	Storage	320
Living Room	720	Circulation	740
Office and Administration	2,416		
Business Center	512	Subtotal	7,030
Boutique	1,040		
Fitness Room	1,296		
Maintenance/Housekeeping	2,784	Lower Level	
Restrooms & Circulation	1,040	Wine Cellar	2,472
Tower & Stairs	476	Cart & Bag Storage	7,432
Men's Facilities		Subtotal	9,904
Wet Area & Lockers	5,232		
Bar & Lounge & Cigar	2,400		
Attendant	432	Pro Shop	3,200
Treatment Rooms	1,012		
Storage, Hall, Entry, Phones	800		
Women's Facilities			
Wet Area & Lockers	1,252		
Lounge	968		
Attendant	256		
Subtotal	34,988	**TOTAL**	**55,122**



SITE PLAN - CLUBHOUSE VICINITY

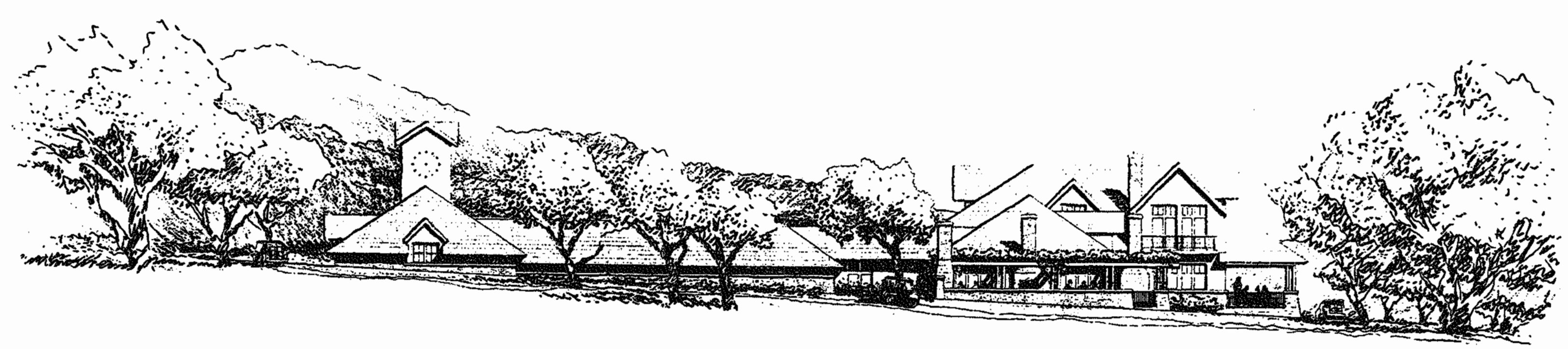
Source: Backen & Gillam

FIGURE 10a

CLUBHOUSE SOUTH ELEVATION

CLUBHOUSE NORTH ELEVATION

CLUBHOUSE EAST ELEVATION



CLUBHOUSE WEST ELEVATION

CLUBHOUSE ELEVATIONS

Source: Backen & Gillam

FIGURE 10b

The clubhouse would be built on three levels, with most functions contained on the main floor at the middle level. The main floor would include ~~a pro shop~~ bar and restaurant, banquet facilities, ~~and a separate members' lounge for corporate members~~, the main hall and reception area, a boutique, fitness center, business and administration offices, and men's and women's locker rooms and lounges. ~~The members' area would include locker rooms, card rooms, a spa and members grill.~~ The lower level would contain the wine cellar and the storage area for bags and golf carts, and the upper level would include the staff locker rooms and lounge, meeting rooms and storage rooms. The pro shop would occupy a stand-alone structure to the east of the main clubhouse. In addition, a small conference center of approximately 6,000 square-feet may be added in the future if demand for meeting space warrants.

The clubhouse would be designed ~~in the style of an Italian hilltown,~~ in the California Regional style, and would take advantage of view opportunities from the base of the hillside. ~~The building would have an adobe type appearance and would be constructed with a building technique known as PISE (Pneumatically Compacted Stabilized Earth) instead of conventional frame construction. By this method the structure of the wall is created by spraying an earth mixture horizontally against a rigid, single thickness form to create walls 24 inches thick. Such massive walls provide excellent insulation for passive heating and cooling~~. The buildings follow the topography of the sloping foothills, and the complex has been arranged in a campus fashion as a series of low, interconnected structures and spaces that break down the perceived mass of the complex. The buildings are intended to harmoniously blend with the environment, and the layout and materials reflect this design objective. A series of natural gardens and terraces soften the appearance of the buildings and merge the interior with the exterior. The materials - stone, plaster, heavy timber, and slate complement the indigenous materials on the site, with the intent of further linking the buildings with their natural context.

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Overnight Accommodations

Adjacent to the clubhouse on the ~~hillside~~ west would be the 45 overnight guest units which would also be constructed in the ~~adobe~~ California Regional style, and would be laid out and designed as an integral part of the overall clubhouse complex (see Figures 10c and 10d). These units would not be typical hotel rooms and would only be available as overnight accommodations for golf course users.

The individual guest units would be approximately 500 to 600 square feet, and would be designed as suites. Some of the guest units would be arranged in clusters surrounding ~~several~~ five small conference rooms of approximately 500 square feet. ~~would be included in the overnight complex. These conference rooms would be located between the two units so they would be accessible from one or both of the adjacent units as needed.~~

Vehicular access to the overnight complex would only be by means of golf carts from the clubhouse ~~parking~~ area. The parking area for the clubhouse and overnight complex would have capacity for ~~188~~ 350 vehicles, with valet parking available from the clubhouse entrance. ~~parking for an additional 61 vehicles to be provided to the north of the clubhouse area adjacent to the practice facility.~~

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~~Equestrian Center~~ Horse Stables

The project would include a small stable where only residents of the project could keep their horses. The stable would be located in the northeastern corner of the site at the base of the easterly facing hillside (see Figure 9a) and would occupy a 1 to 2-acre site. The stable would have a floor area of up to 4,000 square feet and would provide space for up to 10 horses, a small area for hay storage, plus an adjacent corral. The stable would not include any other facilities such as caretakers quarters, riding ring or paddock. The stable would have a simple rustic design to blend in with the rural surroundings. The stable would have driveway access off San Martin Avenue or would be accessible by foot along a path following the toe of the hillside southward to the on-site residential areas.

~~The project would include an equestrian center located on approximately 20 acres at the southeastern corner of the site with driveway access directly off Turlock Avenue. The equestrian center would be open only to project residents for the boarding of privately owned horses. No public horse rental is proposed. The focus of the equestrian center would be a covered riding arena structure measuring 100 by 200 feet. The arena would be surrounded on 3 sides by 20 to 30 indoor/outdoor stalls. The center would also include a hay storage area and living quarters for a caretaker/manager. Other features would include an outdoor riding ring, a training area/paddock and pasture. The access drive and 20 space parking area would be surfaced with all weather crushed gravel~~. The ~~center~~ stable would have direct access to over 8 miles of private riding trails proposed for the permanent open space areas of the Lion's Gate site. These riding trails would consist of a network of existing trails and vehicle tracks that occur throughout the site. Some minor improvements may be needed to these existing trails, but it is not expected that new trails would be created. ~~Access from the equestrian center to these trails would be via the narrow strips of permanent open space extending west and north of the equestrian center along the project boundary (see Figure 9e).~~

In order to prevent horse manure from entering downstream water courses or groundwater, the ~~equestrian facility~~ stable would be operated in accordance with a manure management plan, as required under Title 23, Chapter 15 of the California Code of Regulations (which pertain to the protection of water quality). Under the manure management plan, debris boxes would be used to store daily stall sweepings and manure. ~~The outdoor riding and pasture areas would have manure picked up daily with a special vacuum vehicle.~~ Disposal of wastes at a local landfill, one which is permitted to accept manure, would occur on ~~a daily basis or every other day~~ on an as-needed basis. ~~Alternatively, on site composting of manure may be considered instead of off site disposal. Any proposal to compost manure would require approval from the Department of Environmental Health Solid Waste Unit.)~~ The perimeter of the ~~equestrian center~~ stable site would be fenced to prevent animals from entering nearby drainages ~~and ponds~~ and contaminating the water.

~~The equestrian center would be contoured to direct on site drainage to a grass swale or swales which would convey runoff to a lined retention pond or basin. This pond would be located at the eastern end of the site, just west of the landscaped berm proposed along Turlock Avenue. The pond would be equipped with a sump pump to remove any floating material, and would be cleaned out regularly to remove accumulated sediments. The pond would be sized for the 10 year storm to prevent overflow of accumulated drainage in all but the most significant flood events (the pond would be fenced to prevent entry, and signs would be posted warning people to keep out.) Any drainage from areas upslope of the equestrian center to the west would be directed around the facility to the proposed residential lake to the north.~~

The ~~equestrian center~~ stable would employ vector control measures as needed, such as baiting for flies, and rodent trapping. As discussed above, manure would be cleaned up daily and placed in debris boxes which would be emptied ~~daily or every other day~~ on an as needed basis and taken to a local landfill ~~or composted on-site.~~

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TYPICAL UNITS SOUTH ELEVATION

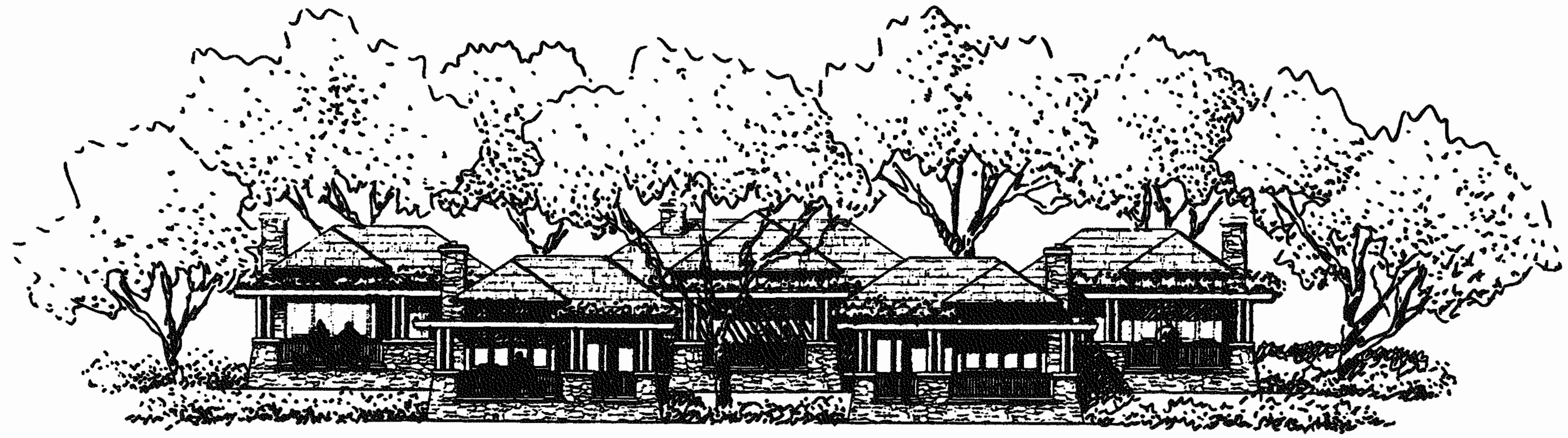
TYPICAL UNITS NORTH ELEVATION

TYPICAL UNITS EAST ELEVATION

OVERNIGHT UNITS - ELEVATIONS

Source: Backen & Gillam

FIGURE 10c



CONFERENCE SUITE SOUTH ELEVATION

CONFERENCE SUITE NORTH ELEVATION

CONFERENCE SUITE WEST ELEVATION

OVERNIGHT UNITS - ELEVATIONS

Source: Backen & Gillam

FIGURE 10d

Grading and Excavation

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Cuts and Fills

The total estimated earthwork for the project is approximately ~~one~~ 1.1 million cubic yards of cut and fill, of which approximately 760,000 cubic yards would be for the golf course. All earthwork would be balanced on the site.

*

Excavations for Lakes

There are ~~four~~ five lakes, ponds and major detention basins proposed as part of the project. These include the following: the irrigation storage reservoir located at the west end of the golf course, which would involve excavation of ~~68,700~~ 63,350 cubic yards of earth; the runoff detention pond ~~near the 18th green~~ adjacent to the 11th hole, which would require removal of ~~7,950~~ 19,500 cubic yards; the wastewater storage pond ~~north of the driving range~~ adjacent to Turlock Avenue, which would entail the excavation of ~~69,000~~ 15,500 cubic yards of material; the 20-acre lake to be located at the main residential subdivision in the southeastern portion of the site, which would involve the removal of 70,200 cubic yards of earth; and the flood detention basin along Coolidge Avenue, which would involve the excavation of 30,000 cubic yards of material. The excess material generated by these excavations would be used in golf course contouring, constructing the berms along Turlock and Coolidge Avenues, and for building pads in the residential subdivisions.

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Drainage

The project largely incorporates the existing natural drainage system into the design of the golf course and residential areas. In the golf course plan there are several instances where short reaches of tributary drainages would be rerouted or piped to accommodate the fairway layout. Along the West Branch of Llagas Creek there are two locations upstream of the clubhouse site where small existing meanders would be removed in the golf plan. The natural drainage channels in the residential areas would be largely unaltered. The existing flow characteristics of West Branch Llagas Creek are not proposed to be altered in the proposed project plans. However, several flood control improvements are proposed which would reduce flooding potential on the project site as well as downstream. These include a diversion along the West Branch of Llagas Creek, a detention basin along Coolidge Avenue, and a lake/detention basin in the residential area south of Highland Avenue. These flood control features are described in Section *III. E. Hydrology and Drainage.*

Golf Course Drainage

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Some underground storm drains would be installed for the clubhouse and overnight complex. Surface runoff from the parking areas would be conveyed to ~~nearby retention basins~~ underground storm drains and conveyed to the main creek channel. The parking lot runoff would pass through an underground biofilter prior to discharge into the creek channel. ~~Stormwater collected in the basins would not be released to the creek channel but would percolate into the soil or evaporate. The retention basins would be cleaned of accumulated sediments as needed.~~

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~~Equestrian Center~~

~~As noted previously, drainage within the equestrian center would be directed to a retention basin to be located at the eastern end of the site near Turlock Avenue. To the extent feasible, natural drainage originating upslope of the equestrian center would be diverted around the equestrian area and directed to the proposed lake to the north.~~

III. ENVIRONMENTAL SETTING, IMPACTS AND MITIGATION MEASURES

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C. PARKS, RECREATION AND OPEN SPACE

Impacts and Mitigation

<u>Impact 1</u>. **The proposed golf course and residential uses would result in the loss of approximately ~~410~~ <u>434</u> acres of semi-natural open space. (Potential Significant Impact)**

The development of the golf course and its related facilities would involve ~~269~~ <u>277</u> acres of land in the central valley area of the site, while the residential subdivisions, ~~and~~ roadways, <u>and the wastewater treatment facility</u> would occupy approximately ~~141~~ <u>157</u> acres. Approximately 16 percent of the total site area would be converted to golf course uses, and ~~8~~ <u>9</u> percent would be converted to residential uses <u>and public facility uses</u>. This acreage consists primarily of fields, an abandoned orchard, grazing land and approximately 20 acres of partially wooded hillsides (although the proposed building envelopes for the two proposed woodland lots are located in areas with little or no tree cover.) The Hayes Valley site was identified as a low priority (rated #26 out of 42) for open space preservation by the County's Open Space 2020 Task Force. The report cited the property's value as watershed, viewshed, and ability to buffer urbanization as primary resources to be protected. The remaining ~~1,265~~ <u>1,242</u> acres of property would remain in permanent open space, as required under the Hillside clustering provisions of the zoning district.

Mitigation 1a. **The project would provide approximately ~~263~~ <u>258</u> acres of managed recreational open space in the form of a public golf course. The golf course would provide an added recreational opportunity in the County.**

The proposed project would provide additional recreational opportunities which would be open to members of the public. The project would help alleviate the well-documented shortage of golf courses in the County.

Mitigation 1b. **The remaining ~~1,265~~ <u>1,242</u> acres of natural and semi-natural area of the site would be preserved as permanent open space as a condition of the cluster development permit.**

Approximately ~~1,265~~ <u>1,242</u> acres of oak woodland and grassland on the site would be preserved as permanent open space. This open space would be managed and maintained by the Homeowners Association for the project, and would not be open to the general public.

D. GEOLOGY AND SOILS

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Impacts and Mitigation

Impact 1. **Potential secondary ground rupture or sympathetic movement along inactive faults crossing the site may result in minor damage to structures, roadways and utility lines. (Potential Significant Impact)**

The previous limited fault investigation on the Hayes Valley site by Wahler Associates in 1990 concluded that both of the on-site fault traces are inactive. This was confirmed through exploratory borings and trenching performed by Twining Laboratories in May 1998. Therefore, the potential hazard due to primary ground rupture (as might occur along an active fault trace) is considered minimal at the project site. Secondary ground rupture or *sympathetic movement* along one of the inactive faults on-site could conceivably occur as the result of the strong groundshaking caused by the occurrence of a large earthquake originating on one of the nearby active faults (e.g., Sargent or San Andreas faults). In the event of a large earthquake nearby, sympathetic movement of a fault within bedrock materials at depth might propagate through the overlying sediments to the break the ground surface; but where bedrock covers significant thickness (more than 5 feet) of alluvium or colluvium, displacement at the ground surface would be considered unlikely, although broad tilting and deformation are possible. Any displacements at the surface of the bedrock from such sympathetic fault movement would likely be small, up to a maximum of several inches. The risk of minor damage to structures, roadways and utility lines crossing the on-site fault traces as a result of secondary ground displacement is negligible, but remotely possible. However, dissimilar earth materials may be juxtaposed across the fault, or structurally weak zones of sheared rock may occur coincident with the faults. Such variable foundation properties can result in excessive differential settlement, and damage may occur to buildings constructed across such zones. The areas of the project that could be potentially affected by on-site fault traces include the site of the clubhouse/overnight complex and proposed Lots 7 through 11, 20 through 24, and 30 and 31 (see Figure 11). ~~The clubhouse and overnight accommodations complex would not be affected.~~

Mitigation 1a. **Where proposed structures for human occupancy are determined to be underlain by an inactive fault trace, mitigation could consist of modification of the soil foundation, using deep foundations, or modifying the location of the structure away from the shear zone. ~~Appropriate setback distances for those structures may be required.~~**

~~Detailed fault investigation would be undertaken where structures for human occupancy are planned for areas suspected of being underlain by faults. These studies would determine the potential for surface displacement along the on-site fault traces, with implementation of recommendations as to appropriate measures for site planning, building design, and utilities engineering. The previous fault study (Wahler, 1990) was relatively general and did not address specific proposed building sites.~~

Potential differential settlement in the vicinity of the fault traces may be mitigated by overexcavation and recompaction of foundation soils across the fault, or by deep foundations such as drilled shafts or driven piles. In addition, mitigation may include modifying the location of the structure away from the shear zone. Specific foundation recommendations will be made by Twining Laboratories in the design level geotechnical engineering report.

~~Based on the findings of such explorations, the project geologist could recommend that habitable structures be located off the faults, or in the event of potential sympathetic movement, that a setback zone be established. An appropriate setback distance would be established in discussions between the County Geologist and the project geologist. There is adequate space on all of the proposed lots to accommodate any changes in building locations. Alternatively, the project geologist may conclude that there is no risk of offset along the fault contacts due to the thickness of alluvium, indicating no need for mitigation or avoidance.~~

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Impact 5. **The presence of unstable slopes and existing landslide deposits on the project site may pose a hazard to proposed structures, and may be affected by project grading. (Potential Significant Impact)**

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~~In addition, the spray irrigation of the practice range with treated effluent, which is proposed as an alternative wastewater disposal method, could destabilize existing slide deposits in this area by increasing pore pressures within the slide masses.~~

~~Due to concerns about potential landsliding affecting the feasibility of the proposed overnight units, and Lots 24, 25 and 26, feasibility level geotechnical evaluations of these areas were conducted by Pacific Geotechnical Engineering in December 1995. With respect to the overnight units, it was found that two landslide deposits located upslope of the complex could become reactivated and impact the proposed structures. It was concluded that, while further design level geotechnical studies would be required, it appears that this landslide hazard "can be mitigated or repaired in conventional fashion without exorbitant cost" (see mitigation measures below). (The feasibility report on the clubhouse and overnight complex is contained in Appendix C.)~~

There are two landslide features to the north of the clubhouse/overnight complex which appear to comprise relatively shallow rotational block slides and slumps. These slides are separated from the complex by a ravine which would preclude impact to the complex if the landslide masses were remobilized. As such, the slide masses do not present a hazard to the complex.

E. HYDROLOGY AND DRAINAGE

This discussion is mainly based on the following reports: Hydrology and Drainage - Lion's Gate Development prepared by Schaaf & Wheeler in November 1995; and the ~~Preliminary Design Report for the~~ Lion's Gate Reserve Master Drainage Plan prepared by Pacific Advanced Civil Engineering in ~~November 1996~~ January 1998 (with an addendum dated April 1998). ~~Both of~~ These reports are contained in Appendix D of this EIR.

Environmental Setting

Area-Wide Drainage

The project site is located in the Llagas Creek watershed which drains from the eastern slopes of the Santa Cruz Mountains and the western slopes of the Mount Hamilton Range south to the Pajaro River and Monterey Bay near Watsonville. The major tributaries of Llagas Creek are Little Llagas Creek, Madrone Channel, Coralitos Creek, San Martin Creek, Church Creek, and West Branch Llagas Creek. Llagas Creek and its tributaries drain a total of approximately 105 square miles upstream of its confluence with the Pajaro River south of Gilroy.

The climate of the south Santa Clara Valley is similar to that of the San Francisco Bay Area. Summers are warm and dry while winters are mild and moderately wet. Nearly 90 percent of the annual rainfall occurs in the late fall or winter months, with January normally being the wettest. The mean annual precipitation varies within the Llagas Creek watershed from a high of over 50 inches in the Santa Cruz Mountains to a low of 14 inches on the valley floor. The basin-wide average is approximately 20 inches per year.

Stream flows in Llagas Creek are regulated by Chesbro Reservoir, which is owned and operated by the Santa Clara Valley Water District. The reservoir has a total storage capacity of approximately 8,100 acre-feet. The reservoir is operated for water supply purposes, but does provide some incidental flood control benefit due to peak flow attenuation.

The upland areas of the Llagas Creek watershed have soils developed on sedimentary rock, basic igneous rocks and serpentine rocks. The main soils are of the Los Gatos, Gaviota, Vallecitos and Haymen associations. They range in depth from shallow to deep, and are located on steep to very steep slopes. The vegetative cover includes grasses, oak, pine, brush and hardwoods. The infiltration rates of water in the upland areas is generally slow. The upland soils are classified as having a high to very high erosion potential.

The upland portions of the Llagas Creek watershed have very little development at this time, and the County General Plan calls for only limited development in the future with mostly open space. On the valley floor, most of the Llagas Creek channel and its tributaries are leveed or perched channels with channel banks higher than adjacent areas on one side or both sides of the stream channel. Therefore, overflows from the channel tend to flow away from and parallel to the channel.

Based on information from the Federal Emergency Management Agency (FEMA) Flood Insurance Study for Santa Clara County, there are extensive areas of floodplain from Llagas Creek and its tributaries. The most serious of these are within the City of Morgan Hill from West Little Llagas Creek, and in the City of Gilroy from West Branch Llagas Creek.

The Santa Clara Valley Water District and the Soil Conservation Service have completed a flood control project for the Llagas Creek watershed. The downstream reach from Bloomfield Road to the Ronan Channel has been improved to 100-year design standards, and the reach from the Ronan Channel to Route 101 has been improved to 10-year design standards. In addition, 100-year design channels have been provided in the urban areas of Morgan Hill and Gilroy. Improvements in Gilroy included diversion of West Branch Llagas Creek to the Ronan Channel, and channel improvements upstream to Day Road. The project was designed to eliminate most flooding in Gilroy south of Day Road. This project has been completed, and FEMA is in the process of changing the Flood Insurance Rate Maps for this area.

Site Drainage and Flooding Conditions

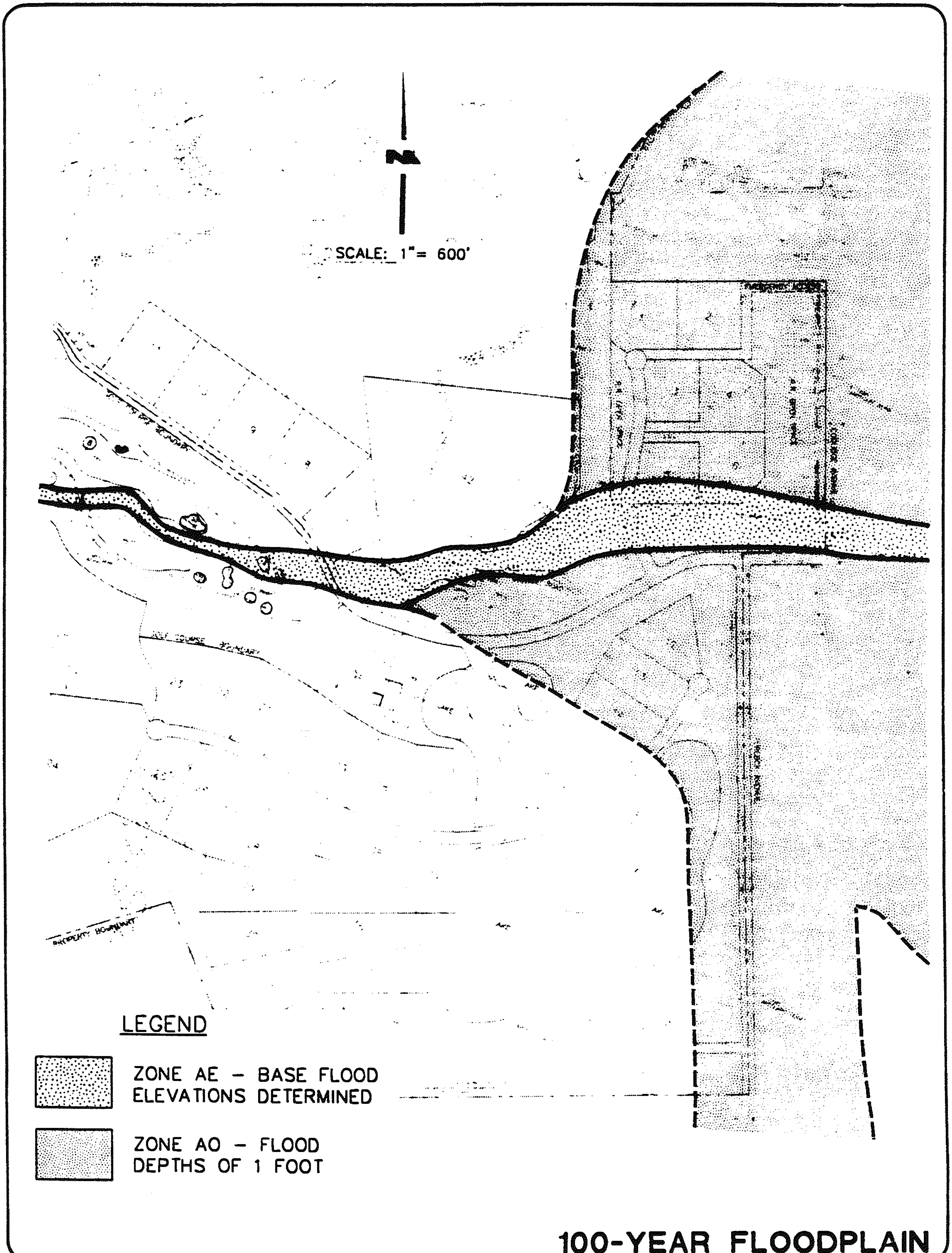
The project site drains to two separate drainages. The western portion of the site drains to the west to Hayes Creek near Watsonville Road while the majority of the site drains via the east to the West Branch Llagas Creek. A network of intermittent and ephemeral streams flow from the higher elevations on the perimeter of the central valley into the West Branch of Llagas Creek. The Creek has 8 primary tributaries, 4 of which drain the hills north of the valley and with the other 4 originating on the southern ridgeline. These tributary streams flow during winter and spring months for varying periods and are dry the remainder of the year. West Branch Llagas Creek discharges to the Ronan Channel which joins Llagas Creek near Highway 152 east of Gilroy. Hayes Creek drains to Llagas Creek near Watsonville Road, south of Morgan Hill. The are no detailed floodplain studies for Hayes Creek. The area is designated as Zone D on the Flood Insurance Rate Map. Zone D is defined as an area of undetermined flood hazard.

As flows in West Branch Llagas Creek reach the eastern project boundary at Coolidge Avenue, they pass under the road through a 3.5' x 6' concrete box culvert. Since the culvert is relatively small compared to the incoming 100-year flow, the creek backs up submerging the culvert and overtopping the northern bank of the channel and flooding the orchard located just north of the channel. As the flow ponds up in the orchard, it crosses Coolidge Avenue at a dip section located approximately 1,200 feet north of the creek. The dip section in the road has a 24-inch reinforced concrete pipe culvert to convey the smaller nuisance flows under the road.

At the southeast corner of the site, ground elevations are low resulting in natural drainage flows toward this corner of the site. As the flows pond up in the corner they enter a 16-inch corrugated metal pipe which conveys the flows from the project site to the adjacent property to the south. The flows then enter two 12-inch pipes that convey the flows under Turlock Avenue to the east. Since the 100-year flow in this area is 161 cfs, which is more than the capacity of the pipes, the road is overtopped at the nearby low point or dip section in the road.

The Flood Insurance Rate Maps for West Branch Llagas Creek do not include detailed floodplain studies upstream of Golden Gate Avenue, approximately 2 miles south of Highland Avenue. The stream channel on the project site is designated as Zone A, approximate 100-year floodplain. At Turlock Avenue, the floodplain is shown as approximately 300 feet wide along the channel north of Highland Avenue.

West Branch Llagas Creek has been restudied by FEMA to update the existing Flood Insurance Rate Maps. The draft work maps are currently in the review process and are not expected to be become effective until late 1996. The SCVWD is using the revised maps as the best available information in the interim. The proposed 100-year floodplain for West Branch Llagas Creek near Highland Avenue is significantly larger on the revised maps than on the current maps. The proposed floodplain includes shallow flooding from the channel commencing at the ranch complex on the project site and including the area south of Highland Avenue, west of Turlock Avenue, and the area north of Highland Avenue west of Coolidge Avenue (see Figure 13).



100-YEAR FLOODPLAIN

FIGURE 13

The hydrology for the detailed floodplain study shows an estimated 100-year peak flow rate of 850 cubic feet per second for West Branch Llagas upstream of Turlock Avenue. An estimated 400 cfs overflows Highland Avenue toward the south upstream of Turlock Avenue. An additional 355 cfs overflows from the channel toward the north upstream of Coolidge Avenue. The northern overflow crosses Coolidge Avenue north site and flows overland to the east and south to the West Branch Llagas Creek channel at Highland Avenue. The majority of the overflow to the south flows overland to the south and east and crosses Turlock Avenue to rejoin the West Branch Llagas Creek floodplain between Highland Avenue and Golden Gate Avenue. A portion of the overflow continues south along the west side of Turlock Avenue.

<u>A more detailed floodplain study was undertaken for the project by Pacific Advanced Civil Engineering in conjunction with preparation of the Master Drainage Plan for the project in January 1998. This floodplain study was based on detailed topographic mapping and ground surveying of the site and adjacent roadways. Therefore, the findings of this study are considered to be the best available information on flooding potential for the project site. This floodplain study estimates the 100-year peak flowrate leaving the eastern edge of the site to be 1,068 cubic feet per second. This includes 797 cfs that overflows the channel of West Branch Llagas Creek east of Coolidge Avenue and north of Highland Avenue, 110 cfs that flows through the culvert at Coolidge Avenue, and 161 cfs that overflows Turlock Avenue in the southeast corner of the site. According to this study there would be no extensive sheet flooding across the eastern portions of the site during the 100-year event, as shown in Figure 13, except for the ponding within 200 feet of Coolidge Avenue north of Highland Avenue and in the extreme southeast corner of the site.</u>

Ordinances and Regulations that Address Drainage and Flooding

<u>County Drainage Manual</u>: This manual contains guidelines for design and installation of drainage facilities for projects. Projects must demonstrate that drainage will be handled adequately in order to avoid drainage and flooding problems. These guidelines ensure that there are no on- or off-site drainage problems associated with a project.

<u>Grading Ordinance</u>: The ordinance requires that all drainage structures and devices be consistent with the adopted County Drainage Manual and its standards. It outlines disposal requirements for both on- and off-site drainage; provides for slope protection and erosion control; and the design of dikes, swales and ditches.

<u>Land Development Regulations</u>: The County Land Development Engineer reviews all projects to ensure no on- or off-site drainage impacts would occur as a result of the proposed project.

<u>Zoning Ordinance</u>: For projects requiring a use permit, Section 47-5(d) of the Zoning Ordinance ensures that adequate storm drainage exists or shall be provided as a part of the project; and that no on- or off-site drainage impacts would result from the project.

<u>Special Flood Hazard Area Ordinance</u>: This ordinance applies to all areas of special flood hazard (i.e., within the 100-year flood zone as established by FEMA) within the unincorporated area of Santa Clara County. No new development shall occur, or structure or improvement shall be constructed in a flood zone without compliance with this ordinance.

Significance Criteria

With respect for flooding and drainage impacts, Appendix G of the CEQA Guidelines states that a project will normally have a significant effect on the environmental if it will: "(g) Cause substantial flooding, erosion or siltation."

Impacts and Mitigation

__Impact 1.__ **The project would potentially result in increased downstream flooding during the 100-year, 10-year, __and more frequent storm events__. (Potential Significant Impact)**

The proposed residential development on the project site would increase the amount of impervious area on the site and therefore increase the runoff from the site.

The cluster residential development area south of Highland Avenue would be served by storm drains which would discharge to the 20-acre lake proposed for the main subdivision area. The overflows from the lake would discharge via storm drains to West Branch Llagas Creek upstream of Coolidge Avenue. In addition, there are approximately 73 acres of hillside area upstream of this residential development area. Drainage from this area would also be collected by the storm drain system and discharge to the lake. The total area of this drainage area is approximately 240 acres.

The golf course would also be located entirely within the West Branch Llagas Creek watershed which drains to the east. There would be no development in the western portion of the site which drains to the west to Hayes Creek. The West Branch Llagas Creek watershed upstream of Turlock Avenue is approximately 1,060 acres or 1.66 square miles. The golf course development would include approximately 240 acres, the majority of which would be landscaping and turf. The upstream hillside areas would not be affected. The existing creek channel and pond would be largely maintained in their existing configurations. A new pond would be constructed west of the existing pond to serve as an irrigation water reservoir and to detain runoff from the undeveloped area upstream. The new pond would include approximately 9 acre-feet of detention storage.

To analyze potential drainage and flooding impacts, the project site was divided into the following 3 drainage areas: the cluster residential subdivision south of Highland Avenue; the area upstream of the existing pond; the area upstream of the proposed new irrigation reservoir; and the area downstream of the pond golf course reservoir. Discharge rates were estimated for the 10-year and 100-year storms for existing and project conditions.

The results of the flooding analysis show that the proposed golf course would reduce the flow from the site to West Branch Llagas Creek. The golf course would decrease the estimated peak runoff from the watershed because the proposed irrigated turf would maintain a dense layer of thatch which would act as a sponge and reduce runoff, whereas the existing unirrigated range grasses tend to be sparse, with exposed dirt between grass clumps, which does not retain as much runoff. The estimated 100-year peak flow from the golf course area would decrease from 780 cubic feet per second to 765 cubic feet per second, a decrease of 2 percent. The 10-year peak flow rate would decrease from 375 cubic feet per second to 360 cubic feet per second, a decrease of 4 percent.

The proposed golf course irrigation reservoir would also act as a detention facility to reduce the estimated peak flow rate from the western portion of the watershed. For purposes of analysis, the existing pond was assumed to be full at the start of the storm and to have minimal effect on the flood hydrograph. The proposed irrigation reservoir was assumed to be full to spillway elevation at the start of the storm, and to have a 12-foot wide spillway. The estimated storage capacity of the pond is 9-acre-feet with 3 feet of flow over the spillway. The detention storage in the irrigation reservoir would reduce the estimated 100-year peak flow at the pond from 59 cubic feet per second to 39 cubic feet per second, a reduction of 20 cubic feet per second. However when routed downstream and combined with the larger watershed downstream, the detention storage reduces the peak by approximately 10 cubic feet per second. This is due to the difference in timing between the peak flow in the upper watershed and the lower portion of the watershed. The peak flow from the upper watershed is delayed by the travel time along the creek channel and arrives after the peak from the lower watershed. Therefore the peaks do not add directly. The detention storage in the upper watershed acts to increase the timing difference of the upper watershed.

The proposed golf course grading would also include local detention areas to contain runoff from the turf areas for water quality purposes. These would also act to reduce runoff from the site, particularly for small storms. The effect of these detention areas on larger storms would depend on the design and placement of each area and whether the upstream hillside areas would drain to the detention areas or directly to the creek. Therefore, the effects of potential detention storage on the golf course other than the larger pond were not considered in the hydrograph analysis.

The flooding analysis indicated that the proposed cluster residential development would result in a potential increase in the peak runoff from the development site. The 100-year peak flow from the entire watershed would increase from 236 cubic feet per second to 301 cubic feet per second, an increase of 28 percent. The 10-year peak flow rate would increase from 120 cubic feet per second to 160 cubic feet per second, an increase of 33 percent. The increase in peak runoff is due to both the increased impervious area in the development, and the more efficient drainage system which collects runoff faster than the existing overland flow conditions.

~~However, the cluster residential subdivision would include a proposed lake, and runoff would be drained to the lake, then released to West Branch Llagas Creek. Only the proposed equestrian center in the southeastern corner of the site would be below the lake elevation and would drain toward Turlock Avenue. There is no storm drain system along Turlock Avenue, but runoff flows along the road under existing conditions.~~

~~The residential cluster subdivision is located in a drainage area of 240 acres, which would drain to the proposed lake. Without the lake, increased peak runoff from the cluster residential subdivision would potentially increase the peak flow in West Branch Llagas Creek downstream of the project.~~

Mitigation 1. ~~**The on-site lake proposed for the southern residential cluster subdivision would be designed to provide sufficient detention storage for increased peak runoff resulting from site development. In addition, a diversion structure would be constructed in the creek channel to divert a substantial portion of storm flows exceeding existing 10-year flow rates to the residential lake, which would be sized to accommodate about one-half of the flows from the 100-year event. With these facilities, the peak flow rates leaving the project site during significant storm events would be substantially lower than under existing conditions.**~~ **In order to control and detain flood flows generated at the site, a diversion channel, a detention basin and a lake are proposed. These structures would be designed to minimize the extent of flooding within the project boundaries, and would reduce peak flood flows leaving the site during the 100-year, 10-year, and 2-year events relative to existing conditions.**

~~The potential increased runoff from the residential area during the 100 year event would be 65 cubic feet per second, without the proposed lake. The proposed lake would have a normal water surface elevation less than the top of bank elevation of West Branch Llagas Creek at the outfall from the pond. The diversion structure in the creek would be designed such that a substantial portion of the flows in the creek less than the existing 10 year peak flow would pass under the structure and would not be able to enter the side channel to the lake. Flows exceeding the 10 year peak flow would be blocked by the structure and diverted to the lake for temporary storage (see Figure 13a). This would reduce the 100 year flow rate leaving the site from approximately 800 cfs under existing conditions to approximately 400 cfs. This substantial reduction in flood flows leaving the site would significantly reduce flooding problems along the West Branch of Llagas Creek downstream of the site. However, there still would be overland and downstream flooding during the 100 year event, but the extent and volume of flooding would be reduced as a result of the proposed diversion and storage. Once the storage capacity of the lake is reached, any additional flows would be prevented from entering the lake. Instead, these extreme flood flows would be allowed to overspill the creek, as would occur under existing conditions. The outflow from the lake would only occur when the water level in the creek is low. Therefore, the outflow from the pond would not contribute to the existing flood problems from the creek channel~~.

~~Since the residential lake would be sized to contain a substantial portion of the 100 year peak flow, the shallow flooding that occurs along the Turlock and Coolidge Avenue frontage areas of the site during the 100 year event would be significantly reduced (see discussion under 'Impact 2' below).~~

~~The equestrian center area in the southeast portion of the project site would not drain to the pond in the residential development area. Due to the site topography, there would be a berm between the equestrian center and the pond to contain the pond. The maximum height of the berm would be approximately 7 feet. The equestrian center would continue to drain to Turlock Avenue and ultimately to West Branch Llagas Creek. Because of the limited impervious area associated with the equestrian center, there should be no increase in runoff from the area after the project. In addition, the proposed equestrian center would include a detention pond for water quality purposes.~~

The main flood control features include a diversion channel to be constructed along the West Branch of Llagas Creek, a detention basin along Coolidge Avenue, and a lake/detention basin in the residential area south of Highland Avenue. These features are shown in Figure 13a and described below.

Diversion Channel along West Branch Llagas Creek

To eliminate flooding along the banks of the creek at the eastern end of the project, a diversion channel is planned to run parallel and south of the existing creek channel. The new channel would branch southward off the existing channel at a point just west of the roadway ('A Street') for the Rural Residential subdivision where it crosses the existing creek channel. The diversion structure would consist of a spillway 75 feet in length. Flows to the existing creek channel would be limited by two 24-inch reinforced concrete pipes that would serve as culverts under 'A Street'. This would serve to divert the major portion of the flood flows to the new parallel channel. The diversion channel would be trapezoidal with a 10-foot bottom width, and would be grass lined. The diversion channel would rejoin the main channel at a point just west of Coolidge Avenue. The existing creek channel would not be altered.

Detention Basin Along Coolidge Avenue

Since the existing culvert at Coolidge Avenue does not have sufficient capacity to convey larger storm events, flooding occurs to the north in the orchard along Coolidge Avenue with flood flows crossing eastward over the roadway at a low point approximately 1,200 feet north. To control this on-site flooding and to reduce flooding over Coolidge Avenue, a 5.5-acre detention basin is planned adjacent to the roadway. The detention basin would be approximately 200 feet wide and 1,000 feet long and have a storage capacity of 23 acre-feet. Flood flows would enter the detention basin at a spillway alongside the creek channel near Coolidge Avenue. Once the detention basin is filled, it would overflow at the northeast corner where flood flows would cross Coolidge Avenue at the low point or dip section. The detention basin is not intended to eliminate flooding altogether, but it would significantly reduce flood flows crossing the dip section of the roadway relative to existing conditions (see Table 4a). The flow reduction is greatest for the 2-year event, which would undergo a reduction of 63 percent as a result of these improvements.

Lake/Detention Basin South of Highland Avenue

The 20-acre lake planned for the residential area south of Highland Avenue would be designed to provide 50 acre-feet of flood storage during major storm events. Drainage from the adjacent residential area and the tributary area in the hills to the west would be conveyed to the residential lake. Once the lake has reached capacity, flows would enter a swale at the south end of the lake which would convey flows to the southeast corner of the site. Overflows from the swale would cross Turlock Avenue at a low point or dip section in the roadway as occurs under existing conditions. However, the flood flows crossing the dip section would be significantly reduced for all major storm events, relative to existing conditions (see Table 4a). The flow reductions are greatest for the 10-year and 2-year events, which would undergo reductions of 62 percent and 81 percent, respectively, as a result of these improvements.

TABLE 4A

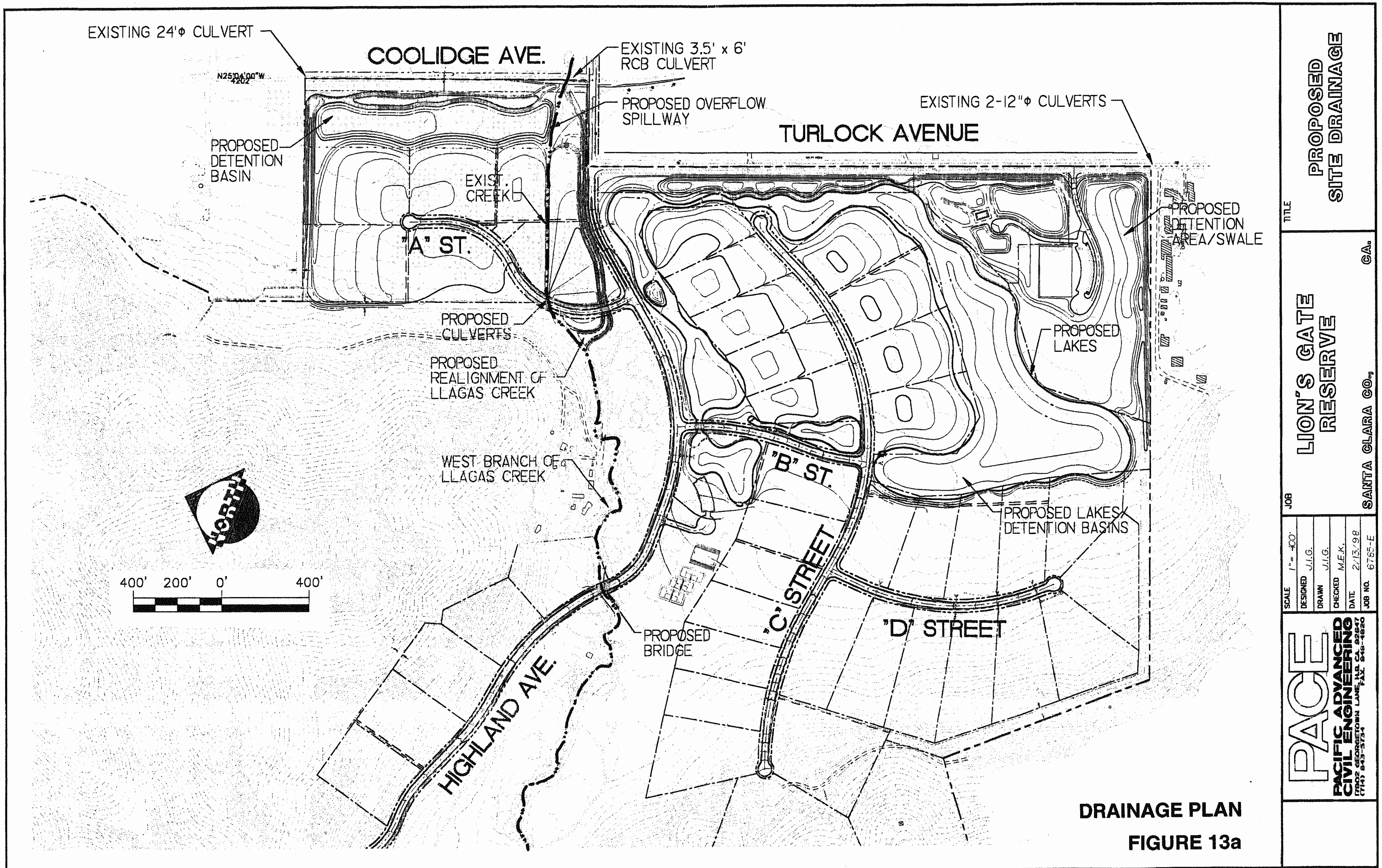
COMPARISION OF FLOOD FLOWS LEAVING THE SITE FOR THE EXISTING AND DEVELOPED CONDITIONS

	Existing Condition Flow (cfs)	**Developed Condition** Flow (cfs)	**Percentage Flow Reduction**
Coolidge Ave. Dip			
100-year	797	753	6%
10-year	332	294	11%
2-year	86	32	63%
Turlock Ave. Dip			
100-year	161	128	20%
10-year	73	28	62%
2-year	31	6	81%

Impact 2. **Portions of the residential cluster subdivisions ~~would~~ may be subject to shallow flooding (one foot average depth) during a 100-year event, and the proposed dwellings could also potentially obstruct this sheet flow through the site. However, the total area of the site that may be subject to shallow flooding would be reduced by flood control improvements included in the project. (Potential Significant Impact)**

Based on the revisions to the existing Flood Insurance Rate Map, shown in Figure 13, the West Branch Llagas Creek would overflow to the south upstream of Turlock Avenue (i.e., at the on-site ranch complex). For the 100-year flood, the FIRM shows that approximately 400 cubic feet per second would cross through the northeastern portion of the cluster residential development, in particular through Lots 12, 13 and 14 at the northeast corner of the subdivision. This mapped overflow crosses the site and Turlock Avenue to rejoin West Branch Llagas Creek 500 to 1,000 feet downstream of Highland Avenue. The overflow is indicated as shallow flooding with an average depth of one foot, indicating that the proposed lots would be prone to flooding. In addition, grading for the residential lots in the overflow area could adversely affect the sheetflow through the area if the flow is obstructed. Similarly, grading for the access road the project and landscaping along Turlock Avenue could affect the sheetflow across the site.

The revised flood maps also show an overflow to the north from West Branch Llagas Creek upstream of Coolidge Avenue. For the 100-year flood, approximately 355 cubic feet per second would cross through proposed the rural residential development north of Highland Avenue and west of Coolidge Avenue. The overflow would flow overland to rejoin West Branch Llagas Creek at the culvert under Highland Avenue. Part of the overflow is designated as shallow flooding with an average depth of one foot, and a small sliver along the north boundary is indicated for flood depths of 0.5 to 2.5 feet. All six of the 5-acre lots are within the mapped 100-year floodplain area and thus would be prone to flooding. Also, grading for the residential lots and cul-de-sac in the floodplain could have an adverse affect on the sheetflow if flow is obstructed.



DRAINAGE PLAN

FIGURE 13a

Both the area subject to potential sheet flooding and the volume of flood water spilled would be substantially reduced by the flood diversion and storage facilities described under 'Mitigation 1' above. The Coolidge detention basin, the residential lake would detain the increment of runoff generated by the project in addition to ~~approximately 400 cfs~~ a portion of the peak flow during the 100-year event (see Table 4A above).~~, which would represent approximately one-half of the overland flows overspilling the creek west of Coolidge/Turlock Avenues on the project site during the 100-year event. The precise reduction in flood plain area would be calculated in conjunction with the preparation of the Final Master Drainage Plan for the project.~~

As noted under 'Environmental Setting', a more detailed floodplain study was undertaken for the project by Pacific Advanced Civil Engineering in conjunction with preparation of the Master Drainage Plan for the project in January 1998. This floodplain study was based on detailed topographic mapping and ground surveying of the site and adjacent roadways. Therefore, the findings of this study are considered to be the best available information on flooding potential for the project site. According to this study there would be no extensive sheet flooding across the eastern portions of the site during the 100-year event, as shown in Figure 13, except for the ponding within 200 feet of Coolidge Avenue north of Highland Avenue and in the extreme southeast corner of the site.

Mitigation 2. **Potential impacts to the residential subdivisions from shallow flooding would be mitigated by constructing building pads on fills raised above flood elevations. The potential obstruction of sheetflows by the proposed development would be mitigated by balancing fills with cuts within the flood-prone areas.**

The potential impact of placing a portion of the proposed residential development within the 100-year floodplain areas, as shown on the revised Flood Insurance Rate Maps, would be mitigated by balancing the grading within the 100-year floodplain. This would mean that fills required to elevate building pads above flood elevations would need to be balanced by cut areas to allow flood flows between the buildings. This procedure is generally most effective in shallow flooding areas with limited building coverage as in the proposed project. If the buildings cover a large percentage of the floodplain and are in deeper flood area, and effective balance between cut and fill would be problematic. For instance, if a building obstructs 50 percent of the floodplain in 3 feet of flood depth, the building pads would have to be elevated 3 feet, and the remainder of the floodplain would have to be excavated 3 feet to balance the cut and fill. This would lead to an elevation difference of 6 feet between the building pads and the adjacent ground. In the proposed project, the building densities would be very low with 2- to 3-acre residential lots. Thus, building elevations of 1 to 2 feet above existing grade would become 2 to 3 feet or less above the new ground elevations because of the larger area available to balance the fill.

In addition, the frontage berms proposed along Coolidge and Turlock Avenues would include sufficient breaks within the flood-prone sections such that the direction of sheet flow during major storm events would not be altered relative to existing conditions.

Although the most recent floodplain study undertaken by Pacific Advanced Civil Engineering in conjunction with the Master Drainage Plan indicates that the eastern portions of the would not be subject to extensive sheet flooding during the 100-year event, the building pads for the dwellings will be above the flood elevations shown on the revised Flood Insurance Rate Maps.

Conclusion. **With implementation of the above mitigations as proposed in the project, the potential flooding impacts of the project would be reduced to less-than-significant levels.**

F. WATER QUALITY

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Impacts and Mitigations

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Impact 3. **The project would generate urban nonpoint pollutants which may be carried in stormwater runoff from paved surfaces to downstream waterbodies. (Potential Significant Impact)**

The introduction of traffic and parking areas would increase accumulated hydrocarbon byproducts and heavy metals from automobiles, which would be flushed into drainages and streams. At the maintenance facility, washwater, lubricants and hazardous materials may be generated. Unless controlled, these urban pollutants would contribute to cumulative nonpoint contaminant loads in downstream drainages and waterbodies.

Mitigation 3. **The project would include stormwater controls at the parking lots and maintenance facilities.**

Sheet flows over the clubhouse ~~and practice range~~ parking lots would be collected and ~~piped to nearby stormwater retention basins. The collected runoff would not be discharged into the West Branch Llagas Creek, but would percolate into the soil or evaporate. The retention basins would be cleaned of accumulated sediments and debris as needed~~ conveyed to the underground drainage system for the golf course. Prior to discharge into the main creek channel, the parking lot runoff would pass through a biofilter consisting of cobbles and gravel to remove sediments and debris.

J. VISUAL AND AESTHETICS

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Impacts and Mitigation

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<u>Impact 1.</u> **The project would result in visual changes to some areas of the site open to public view. (Potential Significant Impact)**

As discussed under 'Environmental Setting' above, the most visually accessible areas of the site are located along Coolidge Avenue (Santa Teresa Boulevard) and Turlock Avenue at the eastern end of the site, and along Watsonville Road to the west. The interior valley area of the site is not visible from off-site vantage points except for the single home that overlooks the site from the northern ridge. The hillside areas nearest to the flanking roadways are also visible.

The residential subdivisions proposed for the eastern end of the site would be partially visible from adjacent land uses and roadways. In the Rural Residential subdivision proposed adjacent to Coolidge Avenue, north of Highland, the 6 proposed lots would be set back from the roadway at least 300 feet toward the adjacent hillside to the west. The setback area would remain as permanent open space, with a landscaped berm ~~and a planted vineyard~~ providing visual screening for these lots. <u>A stormwater detention basin would occupy the open space area between the roadside berm and the residential lots; however, the basin would be entirely screened from the roadway by the intervening landscaped berm.</u>

The residential cluster subdivision proposed for the field west of Turlock Avenue would also be partially visible to passing motorists. However, this subdivision would be set back 200 feet to 1,400 feet from the roadway, and would be screened by the landscaped berms planted with black walnut trees. Nevertheless, the roof lines of the nearest dwellings would be visible from Turlock Avenue and Santa Teresa Boulevard, at least until the black walnuts have matured enough to provide more complete screening (see Figure 16). Since two of the proposed lots (Lots 24 and 25) extend into the adjacent hillside area, it is possible that future custom homes to be built on these lots may be visible from Turlock Avenue and Santa Teresa Boulevard.

<u>The small horse stable planned for the northwest corner of the site would be sited in a small side valley along the toe of the eastern hillsides. The nearest existing land uses include a nursery business located approximately 500 feet east and two single-family dwellings located approximately 800 feet to the northeast and the southeast. The existing nursery with its dense boundary landscaping almost completely screens the stable from view of Coolidge Avenue and the residences in the vicinity.</u>

The package wastewater treatment plant and residential lake occupy the area between the roadside berm and the residential subdivision. However, these project components would be low in profile and almost completely shielded from view by the landscaped berm along Turlock Avenue.

The only other visual changes that would occur at the eastern end of the site would be the roadway improvements and entry features along the Highland Avenue entry way. However, any improvements would be subject to Architecture and Site Approval to ensure that signs, fences, lighting and other features would be compatible with their surroundings. Also, the existing mature landscaping trees around the ranch complex would be retained and incorporated into the project.

From Watsonville Road to the west, very little of the project, if anything, would be visible. All of the area with ¾ mile of the roadway is proposed to be maintained as permanent open space. The golf course would be located to the east of the low saddle that crosses the western portion of the valley, and thus would not be visible from Watsonville Road. It is possible that the maintenance facility proposed for the western end of the golf course may be partially visible from Watsonville Road, ¾ mile to the west. The only evidence of the project alongside Watsonville Road would be the new maintenance access road to be constructed from Watsonville Road to the golf course maintenance facility. There would be no structural entry features such as signage here since no public access to the golf course would be permitted from this direction.

In the interior area of the valley, the golf course, clubhouse and overnight units would not be visible from off-site vantage points~~, except for~~ <u>even from</u> the single dwelling that overlooks the valley from the adjacent ridge to the north. <u>From the vantage point of this residence, the clubhouse/overnight complex would be completely blocked by the intervening low hills and ridges just north of the complex.</u>

Mitigation 1. **The project would be designed and landscaped in a manner to help it blend in with the natural and rural surroundings, and to reduce its visibility from off-site locations.**

The site planning measures proposed as part of the project, including buffer zones from all adjacent roadways, as well as the proposed landscaping and berming, would minimize the potential visual effects of the project. The design of the residential areas reflects many of the guidelines of the San Martin Integrated Design Plan (see Section *II. Consistency with Plans, Policies and Regulations.)*

All structural elements such as signs, fences, lighting or other entry features would be subject to Architectural and Site Approval to ensure their compatibility with the surroundings. In addition, any structures proposed within 100 feet of adjacent scenic roads would be subject to the County's Design Guidelines.

L. NOISE

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Impacts and Mitigation

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Impact 3. **Noise generated by golf course mowers would have a potentially adverse effect on the nearest dwellings proposed on the project site. (Potential Significant Impact)**

The mowing machines used at the golf course would be the loudest noise sources. These pieces of equipment typically generate noise levels no higher than 70 dBA at a distance of 50 feet.

The closest existing residence to the proposed golf course would be the existing ranch house near the eastern limits of the project site, which would be 900 feet from the golf course at its nearest point. At this location, the highest noise levels from mowers would be approximately 45 dBA. The average noise levels would be less.

The second closest residence would be the home to the north of the central area of the site on the nearest off-site ridge, which would look down on the golf course, and which would be 1,600 feet from the golf course at its nearest point. For this home, the maximum noise levels generated by lawn mowers would be 41 dBA at the nearest point near the project boundary. This noise level would be barely audible with the windows open.

The closest new lots in the proposed cluster subdivision along the north side of the main access road would be ~~200~~ approximately 70 feet from the golf course at the nearest points, and the dwellings themselves would be ~~at least~~ ~~230~~ approximately 120 to 150 feet away (~~given the minimum required front setback distance of 30 feet~~ since these estate homes would be set back at 50 to 80 feet from the roadway). At the ~~nearest~~ front of the dwellings, the maximum noise from mowers would be approximately ~~58~~ 61 to 63 dBA (noise levels drop off by 6 dBA for each doubling of distance from the source). The maximum levels of mowing noise would exceed the County's 55 dBA threshold for the new proposed lots in the subdivision located north of Holes ~~8~~ 1 and ~~9~~ 2 at the eastern end of the golf course. According to the County's noise ordinance, however, ~~the maximum mowing~~ noise levels of ~~58~~ 60 to 65 dBA would not constitute a noise impact if the residences were subject to these noise levels for less than ~~15~~ 5 minutes in any hour, and noise levels of 55 to 60 dBA would not constitute a noise impact if the residences were subject to these noise levels for less than 15 minutes in any hour. Since maximum noise levels would drop off to 55 dBA at a distance of approximately ~~330~~ 350 feet from the source, ~~the noise threshold would be exceeded by the mowing of a band of turf 100 feet wide (or less, depending on the location of individual dwellings relative to the fairway)~~ turf mowing would be in compliance with the noise ordinance if it occurred for no more than 5 minutes in any hour along the northern-most 30 feet of fairway along the roadway, and for no more than 15 minutes in any hour with the band between 30 feet and 230 feet from the roadway. It is expected that the gang reel mowers would complete mowing of ~~that strip within 15 minutes~~ these areas within the alloted times with respect to any of the individual residences affected. It should be noted that the average noise level generated by mowers would be less than 5 dBA above the background level in the area of the proposed residences. In addition, fairway mowing would typically occur in the afternoon.

Mitigation 3. **The hours of mowing within ~~330~~ 350 feet of any existing or proposed residences, would be restricted to weekdays between the hours of 8:00 a.m. and 5:00 p.m., with total noise generating activities in those areas restricted in accordance with the limits set forth in the County's Noise Ordinance.**

Beyond the requirements of the County's Noise Ordinance, the CC&Rs for the project should establish clear guidelines for operational golf course noise to minimize potential annoyance and inconvenience for all concerned.

Impact 4. **Activities at the clubhouse would increase noise levels in the interior of Hayes Valley. (Less-than-Significant Impact)**

Events at the clubhouse, such as weddings or banquets, would generate noise from music played at such events. There are two existing residences in the vicinity which would be within audible range of the clubhouse. One residence is located approximately ~~3,600~~ 3,000 feet from the clubhouse on the northern ridge overlooking the valley. An on-site ridge located mid-way between the clubhouse and this residence would break the line of sight between these two structures and would provide noise shielding under normal atmospheric conditions. The second potentially affected residence is the existing on-site ranch house located approximately ~~2,400~~ 3,000 feet east of the clubhouse, along West Branch Llagas Creek. The line of sight between the clubhouse and the ranch house would be unbroken by intervening terrain.

To evaluate potential noise impacts to these existing residences, worst-case meteorological conditions were assumed. The conditions of maximum sound propagation would be a temperature inversion with a light wind blowing toward the receiver. Under these conditions the sound levels would bend down from the atmosphere toward the receptor, thus negating shielding by intervening hills, buildings and other barriers. It was calculated by Illingworth & Rodkin that the sound level of a loud rock band inside the clubhouse with the windows open would be about 35 to 40 dBA outside the on-site ranch to the east, and about 35 dBA outside the ridgetop house to the north. Under the vast majority of meteorological conditions, sound levels would be 10 to 20 dBA lower, and essentially inaudible. Under conditions of good sound propagation, the sound of a very loud event at the clubhouse could be audible outdoors at these residences. However, it is also most likely that under these conditions the windows in the clubhouse would be closed because it would have to be quite cold to create the type of inversion needed to result in the highest sound levels. Therefore, it is expected that sound from the clubhouse would be audible at the nearest residences, but only under rare circumstances.

The nearest residences proposed within the project itself would be located ~~1,200~~ 1,500 feet to the east of the clubhouse. Under the worst-case meteorological conditions described above, the noise level at the nearest residence would be about 40 to 45 dBA, outside the residence. This noise level would still be well under the County's noise criteria of 55 dBA for residential land uses.

Mitigation 4. **No mitigation required.**

<u>Impact 5.</u> **Noise levels would be temporarily elevated during grading and construction. (Potential Significant Impact)**

Most of the existing noise receptors in the area are far from the main grading and construction area of the golf course. The major exception is the existing ranch house at the east end of the site. During construction, maximum noise levels generated by grading, paving, and other activities would be 5 to 10 decibels lower. If average levels do not exceed 55 dBA, there would be no interference with outdoor activity or indoor activity, although the construction may be occasionally audible. Noise levels at the existing ranch could reach as high as 80 dBA with average levels of up to 75 dBA. During most of construction, however, noise levels would be significantly below 55 dBA.

The existing residence on the ridge to the north of the project site would be approximately 1,200 feet from the nearest grading activity for the golf course. At this distance, the sound of equipment would be noticeable but would not exceed 55 dBA.

At the eastern end of the project site, existing dwellings in the vicinity would be subject to short-term grading and construction noise impacts from construction of the perimeter berms, <u>the detention basin along Coolidge Avenue, the package wastewater treatment plant and lake/detention basin along Turlock Avenue,</u> and to a lesser extent the proposed residential subdivisions which would be set back from the site boundary.

At the western end of the site, the construction of the maintenance access road to Watsonville Road would generate noise from grading and paving. The nearest existing dwelling would be 700 feet from this maintenance road at its nearest point, and would not be subject to construction noise impacts, although the noise would be audible.

Mitigation 5. **Short-term construction noise impacts would be reduced through compliance with the County's Noise Ordinance with respect to hours of operation and maximum noise levels at adjacent property lines. <u>At the eastern edge of the project, the berms proposed along the project boundary would be constructed during the early phases of grading to provide a noise barrier for existing residences nearby.</u>**

~~For example,~~ <u>T</u>he Noise Ordinance stipulates that construction noise generated between 7 am and 7 pm on weekdays and Saturdays should reach noise levels no greater than 75 dBA at an adjoining property line of a single-family or two-family dwelling.

These hours would be enforced by the grading inspector, and also the County Department of Environmental Health in the event of a violation of the County Noise Ordinance.

To minimize noise generation, construction equipment should be maintained in good operating condition and properly muffled.

To further reduce construction noise impacts, the berms proposed for the eastern project boundaries would be constructed during the early phases of grading in order to provide shielding from construction and grading in the interior of the project. <u>This would be</u>

particularly effective in attenuating noise from grading and excavation for the detention basin along Coolidge Avenue, and the package wastewater treatment plant and lake/detention basin along Turlock Avenue.

Conclusion. **Implementation of the above mitigation measures would reduce noise impacts resulting from the project to less-than-significant levels.**

N. HAZARDOUS MATERIALS, PUBLIC HEALTH AND SAFETY

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Impacts and Mitigations

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Impact 4. **The ~~equestrian facility~~ horse stable could result in potential vector and odor impacts. (Potential Significant Impact)**

Vectors such as flies and rodents could become a problem if the stables~~-are~~ is not properly managed. Offensive odors could develop from a large accumulation of manure or other poor husbandry practices.

Mitigation 4. **The ~~equestrian facility~~ stable would employ vector control measures, and would be operated in accordance with a manure management plan in conformance with State law, which would also be reviewed and approved by the County Department of Environmental Health.**

A manure management plan would be required under Title 23, Chapter 15 of the California Code of Regulations. The stable would be operated as cleanly as possible to reduce vectors and the potential for odor. Specific vector controls would include baiting for flies, manure management and rodent trapping. Hay would be stored in a small barn and all feed grain would be stored in enclosed containers to reduce availability to rodents.

Manure management practices would consist of cleaning up manure daily and placing it in debris boxes which would be emptied ~~daily or every other day~~ on an as-needed basis and taken to a local landfill.

The ~~equestrian facility~~ stable would be subject to Article 47 of the County zoning ordinance which requires that stables not create a nuisance, and that they be set back from water courses and neighboring uses. The ordinance requires that erosion control plans be prepared for stables, and that they by subject to Architecture and Site Approval.

APPENDICES

APPENDIX C

Geologic and Geotechnical Site Review

Prepared by

Twining Laboratories

May 1998

GEOLOGIC AND GEOTECHNICAL SITE REVIEW
NEW CLUBHOUSE AND OVERNIGHT LODGES
CORDEVALLE GOLF CLUB AND HOTEL
SAN MARTIN, CALIFORNIA

Project Number: D34301.03

Prepared by The Twining Laboratories

for:

Lion's Gate Limited Partnership, LLC
395 Oyster Point Boulevard, Suite 309
South San Francisco, California 94080

May 29, 1998

D34301.03-02

May 29, 1998

Lion's Gate Limited Partnership, LLC
395 Oyster Point Boulevard, Suite 309
South San Francisco, California 94080

Attention: Mr. Sky Joyner

Subject: Geologic and Geotechnical Site Review:
New Clubhouse and Overnight Lodge Area
Cordevalle Golf Club and Hotel
San Martin, California

Dear Mr. Joyner:

The Twining Laboratories (Twining) is pleased to submit this report of Geologic and Geotechnical Site Review evaluating potential geologic and geotechnical hazards that could impact the new Clubhouse and Overnight Lodges site at the Cordevalle Golf Club and Hotel. The proposed site location is on a gently sloping hillside, north of the golf course. Geologic and geotechnical hazards were previously evaluated by Twining for a Clubhouse and Overnight Lodge facilities site about 1,000 feet south of the currently proposed site location. Twining has also performed several geologic and geotechnical investigations for other projects near the proposed Clubhouse and Overnight Lodge site (see section 2.0). In addition, Twining performed a geologic site reconnaissance for the subject site and is currently conducting a preliminary geotechnical investigation. Twining was requested and authorized to perform this site review by Mr. Ron Davis, with the Cordevalle Golf Club and Hotel, on May 20, 1998.

The potential hazards investigated included expansive soils, erosive soils, shallow groundwater, landslides and slope stability, seismic ground shaking, fault rupture, earthquake induced liquefaction and seismic settlement. Our assessment indicates that the proposed development is feasible with respect to the geologic and seismic hazards evaluated, provided the conclusions and proposed mitigative measures described in this report are implemented.

We appreciate the opportunity to be of service to Lion's Gate Limited Partnership, LLC. If you have any questions regarding this report, or if we can be of further assistance, please contact us at your convenience.

Sincerely,
THE TWINING LABORATORIES, INC.

Kenneth J. Clark, CEG
Engineering Geologist
Geotechnical Engineering Division

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SAN MARTIN, CALIFORNIA

1.0 INTRODUCTION

This investigation evaluates potential geologic and geotechnical hazards that could impact the new Clubhouse and Overnight Lodges site located at the Cordevalle Golf Club and Hotel.

The Geotechnical Engineering Division of Twining, headquartered in Fresno, California, performed the investigation. This report is provided specifically for the new Clubhouse and Overnight Lodges site located at the Cordevalle Golf Club and Hotel, referenced in the "Background Information" section of this report.

2.0 PURPOSE AND SCOPE OF INVESTIGATION

The purpose of the investigation was to evaluate geologic hazards and general geotechnical conditions relevant to the proposed development of the subject property in support of an environmental impact report for the project.

This investigation did not include a design level geotechnical engineering investigation, pavement design, floodplain investigation, compaction tests for construction, environmental investigation, or environmental audit.

The actions undertaken during the investigation are summarized as follows.

I. The following documents prepared by others were reviewed:

- Prepurchase Site Assessment of Geologic Hazards, Ground Water Supply and Environmental/Toxic Contamination, Hayes Valley Property, Santa Clara, California, Project 4297, prepared for LAND USE, by TERRATECH, INC., January 20 1988.

- Supplemental Geological Reconnaissance Investigation for Proposed Hayes Valley Dams, Santa Clara County, California, prepared by Kaldveer Associates Geoscience Consultants, August 4, 1989.

- Geologic Input to Draft Environmental Impacted Report, Lions Gate Development, project HRC-101B, prepared by Wahler Associates for HR Development Partners, April 17, 1990.

- Geologic Input to EIR, prepared by ENGEO Incorporated, April 13, 1993.

- o Geologic Feasibility Investigation, Golf Course Maintenance Building, The Lion's Gate Reserve, San Martin , California, Project 1385/6G, prepared for Hayes Valley Development Partners, by Pacific Geotechnical Engineering, December 1995.

- o Preliminary Geologic Feasibility Evaluation, Homesites on Parcels #24, #25, and #26, The Lion's Gate Reserve, San Martin, California, Project 1385/7G, prepared for Hayes Valley Development Partners, by Pacific Geotechnical Engineering, December 1995.

- o Geologic Feasibility Investigation, Clubhouse and Overnight Lodges, The Lion's Gate Reserve, San Martin, California, Project 1385/5G, prepared for Hayes Valley Development Partners, by Pacific Geotechnical Engineering, December 1995.

- o Administrative Draft Environmental Impact Report, Volume IIa Technical Appendices, Lion's Gate Reserve, December 1995.

- o Draft Environmental Impact Report, Volume II Technical Appendices B through E, Lion's Gate Reserve, March 1996.

II. The following geologic and geotechnical reports prepared by The Twining Laboratories were reviewed:

- o Report entitled Preliminary Geotechnical Engineering Investigation, Golf Coarse, dated March 18, 1997, and Addendums No. 1 and No. 2.

- o Letter report entitled "Review of Site Geologic Conditions and Grading Plans, Golf Course Phase", dated May 6, 1997.

- o Report entitled "Preliminary Geotechnical Engineering Investigation, Clubhouse and Overnight Lodges" (former proposed site), dated October 30, 1997.

- o Letter report entitled "Preliminary Evaluation of Geotechnical and Geological feasibility, Clubhouse and Overnight Lodge Area" (proposed new site), dated April 16, 1998.

III. Reviewed pertinent published geologic literature and maps for the project site area.

IV. A site reconnaissance and subsurface exploration were conducted on May 5 and 20, 1998.

V. Mr. Ron Davis and Mr. Sky Joyner with Cordevalle Golf Club and Hotel, and Mr. Bert Verrips with Nolte Engineering, and Mr. Loren Kroeger with Backen & Gillam Architects, were consulted during the investigation.

VI. The data obtained from the investigation were evaluated and this report was prepared to present our findings and recommendations.

3.0 BACKGROUND INFORMATION

The following background information is based on our review of the documents listed in section 2.0, consultation with the project planners, and geologic reconnaissance, and our preliminary geotechnical investigation of the site. The site description, anticipated construction, previous studies, and regional geologic conditions are summarized in the following subsections.

3.1 Site Description: The proposed Clubhouse and Overnight Lodges site occupies a portion of the 1,676 acre Cordevalle Golf Club and Hotel. The Cordevalle Golf Club and Hotel is located west of the intersection of Highland and Turlock Avenues, about two miles southwest of the City of San Martin in Santa Clara County, California. A site location map is provided as Drawing No. 1. The proposed Clubhouse and Overnight Lodges are to be located on a gently sloping colluvial swale and a sloping hillside, north of the proposed golf course. A Pro Shop is proposed east of the Clubhouse, and a Range House is proposed north of the Clubhouse. An ephemeral creek is located between the Clubhouse and the Pro Shop. Llagas Creek is located about 75 to 100 feet south of the proposed facilities. Native slope gradients range from about 2.5 horizontal (H) to 1 vertical (V) on the hillside, to nearly flat near the ephemeral creek. Drawing No. 2 provides a conceptual plan of the facilities.

3.2 Anticipated Construction: We understand that design of the proposed Clubhouse and Overnight Lodges is currently underway, and final details have not been finalized. Anticipated construction includes the construction of the Clubhouse, Overnight Lodges, and associated asphaltic paved roads, parking lots, driveways, and cart paths. The proposed construction will include a Clubhouse building which is largely one-story and 34,000 square feet in plan dimension. The Clubhouse will include an approximate 7,000 square foot second-story, and a 9,000 square foot partial basement for a wine cellar and cart storage. We anticipate the Clubhouse will have a slab-on-grade floor at the basement level, and concrete floor slabs on a steel framed metal pan deck for the ground floor level.

Forty-five Overnight Lodges are planned for the south facing hillside slope, west of the proposed Clubhouse. The Overnight Lodge units will be 550 to 600 square feet in plan dimension. Five meeting rooms with plan dimensions of about 500 square feet will be connected to individual Overnight Lodge units. The lodges and meeting rooms will be slab-on-grade, wood-frame structures.

Grading plans were not available at the time this report was prepared; however, earthwork cuts on the order of 10 feet or less and fills of 10 to 20 feet are anticipated for the Clubhouse and Overnight Lodges.

3.3 **Previous Studies:** We have reviewed the geologic reports listed under "Purpose and Scope". Most of the cited reports present descriptions of regional geologic and tectonic conditions, and general site geologic conditions. Our summary of these regional conditions are presented below. Geologic conditions applicable to the subject site, which are described in these reports, and conditions noted during our field reconnaissance and geotechnical investigation of the site, are summarized in the "Evaluation" section of this report.

3.4 **Regional Geologic Conditions:** The earth materials underlying the project site region are composed of rocks belonging to the Franciscan Complex of Jurassic to Cretaceous age. Bedrock types found within the Hayes Valley area include sandstone, shale, chert, limestone, greenstone, and low grade metamorphic rocks. Many areas of bedrock terrane include a mixture of different rock types in a sheared matrix. This formational mixture is termed a melange, and was formed as a result of intense shearing and faulting. Serpentine type rock is also found within this assemblage of rocks.

The regional trend of geologic structures in the Hayes Valley area is roughly east-west, acute to the overall geologic structure of north 40 degrees east for the Santa Cruz Mountains as a whole. Physiographic features, bedrock contacts, and faults are generally parallel to this structural trend.

The distribution of geologic units and structures (including faults) depicted on the ENGEO map is generally suitable for planning purposes for the proposed project. This map is included as Figure No. 2 of the report entitled "Geologic Input for EIR For Lion's Gate Property", dated April 13, 1993 (contained in the Draft Environmental Report [DEIR]).

The Sargent-Berrocal faults are located approximately 2.5 miles southwest of the site and the active San Andreas Fault is located approximately 5 miles southwest of the site. The active Calaveras and Hayward faults are both located approximately 8 miles northeast of the site. Regional geologic maps prepared by U.S. Geological Survey and the California Division of Mines and Geology show a bedrock fault and bedrock contacts within the melange terrane on the north side of Hayes Valley. The fault and contacts are shown on the Geologic Index Map (Figure 1) of the Geologic Feasibility Investigation for the Clubhouse and Overnight Lodges, prepared by Pacific Geotechnical Engineering, dated December 1995.

4.0 FIELD INVESTIGATION

4.1 Geologic Field Reconnaissance: A geologic field reconnaissance of the proposed Clubhouse and Overnight Lodges area was conducted in conjunction with our geotechnical investigation of the golf course and surrounding areas, performed on April 28, 1997. The reconnaissance, which included confirming previously mapped geologic features and noting potential geologic hazards, was performed by Mr. Kenneth J. Clark, a Twining Certified Engineering Geologist. Field reconnaissance of the subject site was also performed by Mr. Clark on May 5, 1998. The results of the reconnaissance are provided in the Section 6.0 "Evaluation".

4.2 Geotechnical Investigation Test Borings: On May 5, 1998, five test borings were drilled by Twining within the proposed Clubhouse and Overnight Lodges area to investigate soil, rock, and groundwater conditions. The borings were advanced to a depth of 20 feet below site grade, or until refusal was encountered on hard bedrock materials. Disturbed and undisturbed soil samples were collected for geotechnical laboratory analyses in conjunction with the geotechnical engineering investigation. In addition, two bulk samples were collected for R-value testing (for pavement design). The test borings were drilled, and R-value samples were collected at the locations shown in Drawing No. 2.

4.3 Exploratory Trenching: On May 7, 1998, two exploratory trenches (Trenches A and B) were excavated across the proposed Clubhouse and Overnight Lodges sites to assess potential faults and general subsurface soil and rock conditions. Three additional exploratory trenches (Trenches C, D, and E) were excavated on May 20, 1998 in the area of the Overnight Lodges. Soil and rock exposed in the trench walls were observed by Twining's engineering geologist on May 20, 1998. The locations of the trenches are shown on Drawing No. 2.

5.0 FINDINGS

5.1 Site Soil and Rock Conditions: The project site spans two general geologic units. The proposed locations of the eastern half of the Clubhouse, Range Building, and the entire Pro Shop are located predominantly on Quaternary alluvial soils located in the lower drainage areas. Soils below the proposed Clubhouse and Pro Shop locations comprised gravelly and sandy lean clays. The clays were generally soft to medium stiff from the ground surface to a depth of about 3 feet BSG. The underlying clays were stiff to very stiff as indicated by Standard Penetration Resistance blow counts documented during collection of soil samples. Weathered greenstone was encountered between depths of 7 to 19 feet below site grade (BSG) in the borings drilled at the proposed clubhouse and Pro Shop sites. If treated as a soil, the weathered greenstone was dense to very dense as indicated by blow counts.

The Overnight Lodges are to be located on the hillside portions of the site. The hillside areas are comprised primarily of relatively shallow soils overlying greenstone rocks of the Franciscan Complex. Exploratory trenches revealed bedrock at a depth of about 2 to 4 feet BSG on the hillside areas investigated.

5.2 **Groundwater Conditions:** Groundwater occurs in the alluvial soils on the eastern portion of the site, in the area of the proposed Clubhouse, Range House, and Pro Shop. Groundwater was encountered at depths of 5.5 and 16 feet BSG in two borings drilled in the eastern portion of the Clubhouse area. One test boring drilled in the western portion of the Clubhouse did not encounter groundwater above the depth of refusal on bedrock at 7 feet BSG.

Groundwater was not encountered in exploratory trenches excavated on the hillside locations of the Overnight Lodges. However, the presence of near surface (standing) water and phreatophyte vegetation suggest that groundwater seepage may occur from native slopes in the project area. In addition, springs were reported (ENGEO, Incorporated, 1993) occurring along a fault lineation within the proposed site area. Seepage would likely be exacerbated on cut slopes constructed for the project.

Erosion may be accelerated and slope stability compromised where groundwater daylights (seeps) onto slopes. Conditions in the site area favoring seeps include relatively shallow bedrock (or other impermeable layer) with an overlying permeable soil, and inactive fault zones which can act to concentrate subsurface water.

5.3 **Faults:** Two subparallel fault traces have been mapped in the immediate site area (Wahler Associates, 1990, and Kaldveer Associates, 1989). The locations of these mapped faults are shown on Drawing No. 2 with respect to the proposed facilities. The northern trace is located near the axis of the ravine, north of the clubhouse. The southern fault is located through the area of the Overnight Lodges.

Two brecciated zones indicative of faulting were noted in Exploratory Trench A. Rocks in the brecciated zone were a light grey color and appeared to be sheared and chemically altered greenstone. The location of the brecciated zone is approximately coincident with the south fault trace, the springs noted by Wahler (1990), and our field reconnaissance. A dark brown lean clay soil horizon was developed on both the weathered greenstone, as well as rocks in the brecciated zone. The lean clay soil did not appear to be offset or disrupted above the brecciated zone which would suggest recent movement.

6.0 EVALUATION

This section presents information regarding potential geologic, geotechnical, and seismic hazards at the Clubhouse and Overnight Lodges area.

6.1 Geologic Hazards: Geologic and geotechnical hazards including expansive soils, erosion, landslides, seiches, tsunamis, and volcanic activity are evaluated in the following subsections.

6.1.1 Expansive Soils: The predominant soil type anticipated at the site area is lean clay. In general, the clayey soils (revealed during previous investigations near the site area) exhibited, moderate compressibility, and the potential for low to moderate swell. The primary geotechnical concerns at the site are the medium expansion potential of the lean clays. Over time the near surface clays will experience cyclic drying and wetting as the dry and wet seasons pass. The clay soils encountered at the site are anticipated to experience volumetric changes (shrink/swell) as the moisture content of the clay soils fluctuate. These shrink/swell cycles can impact foundations and lightly loaded slabs-on-grade even though the expansion potential is classified as medium. Expansive soils cause more damage to structures, particularly light buildings and pavements, than any other natural hazard, including earthquakes and floods (Jones and Holtz, 1973). Expansion potential may not manifest itself until months or years after construction. At most sites there exists a depth to which the moisture content of the subgrade remains essentially constant throughout the year; thus, the clays would not undergo a significant volume change below this depth. Therefore, the depth, referred to as the "critical depth", to which significant moisture fluctuation occurs influences the selection of suitable foundation and floor slab alternatives for this site. Climatic conditions, groundwater conditions, landscape irrigation, and the soil conditions effect the critical depth. Our review of moisture data and observations of near surface clay soils did not clearly demonstrate a critical zone depth. Based on experience, it is expected that the critical zone would be approximately 36 inches BSG in the site region, and that seasonal moisture fluctuation would effect soils to a depth of 3 feet BSG. The above estimate of the critical depth should be reevaluated based on soil sample test data to be generated for the proposed geotechnical and geological investigation.

6.1.2 Erosion Hazard: Erosional features indicative of the unusually rapid erosion of the earth materials at the site were not noted during our field reconnaissance. Based on our geologic and geotechnical investigation of the site, the soil and rock conditions are not prone to excessive erosion. Accordingly, the potential erosion hazard at the site is low.

6.1.3 Landslides and Slope Stability: Landslides on the proposed development site were mapped by others (Kaldveer Associates, 1989, and Wahler Associates, 1990). The locations of these landslides are shown on Figure No. 2 of the report entitled "Geologic Input for the Lion's Gate Property" (DEIR Volume II) which is a compilation of site data generated prior to April 1993. Two previously mapped landslide features near the site were observed during our geologic field reconnaissance and appeared to comprise relatively shallow rotational block slides and slumps. The two mapped landslide masses are located north of the proposed Clubhouse and Overnight Lodges site. These slides are separated from the subject site by a ravine which would preclude impact to the site if the masses were remobilized. Accordingly, the documented slide masses do not present a hazard to the project site.

Other existing slide features, which could potentially affect the proposed project, were not noted during our geologic field reconnaissance. Based on our field observations native slopes in the vicinity of the project site appear to be relatively stable.

6.1.4 **Inactive Faults as Foundation Discontinuities**: Subsection 6.2.2 indicates that faults noted in the subject area are inactive and the potential is low for ground rupture due to earthquake faulting, or rupture due to seismic ground motion induced movement across an inactive fault. However, structures built across faults may be supported on soil or rock materials with highly variable foundation properties and excessive differential settlement can result. Variable foundation properties may result from dissimilar earth materials juxtaposed across the fault, or by structurally weak zones of sheared rock coincident with the faults. Potential differential settlement due to weak shear zones may be mitigated by soil foundation modification, using deep foundations, or modifying the location of a structure away from the shear zone. Mitigation measures are described in subsection 7.7.

6.1.5 **Serpentinite**: Twining's field investigation did not encounter serpentinite type rock materials in the project area. In addition, the "Aerial Geologic Map" prepared by Kaldveer Associates (1990) does not indicate serpentinite in the area of the proposed Clubhouse and Overnight Lodges. Accordingly, the potential for encountering naturally occurring asbestos materials during grading for the project is low.

6.1.6 **Seiches and Tsunamis**: A seiche is a wave generated by the periodic oscillation of a body of water whose period is a function of the resonant characteristics of the containing basin as controlled by its physical dimensions. These periods generally range from a few minutes to an hour or more. The site is not near any large bodies of water, so seiches are not considered a significant hazard at the site.

Tsunamis are waves generated in oceans from seismic activity. Due to the inland location of the site, there is no potential hazard from tsunamis.

6.1.7 **Volcanic Activity:** The closest known post Quaternary volcanic areas are near the Mammoth Mountain area in the Sierra Nevada Mountains, approximately 130 miles east of the site. Based on the distance of potential volcanic sources from the site, the prospects for lava flows or significant ash falls are low.

6.2 Seismic Hazards: The potential seismic hazards of ground shaking, ground rupture, liquefaction, and seismic settlement are evaluated in the following subsections.

6.2.1 Ground Shaking: For any given earthquake, the rock in the immediate vicinity will respond with a certain maximum acceleration and with a predominant period that depends on the nature of the rock and on the source mechanism. Away from the focus of the earthquake, the shock waves begin to attenuate. The way in which the earthquake wave is altered depends to a great degree on source characteristics and to a lesser degree on the travel path.

A detailed seismic analysis was conducted using two different methods, historic and probabilistic. Discussion of the analyses and the results are presented in the following subsections.

6.2.1.1 Historic Seismic Activity: The general area of the site has experienced recurring seismic activity. Based on historical earthquake catalogs published by the California Division of Mines and Geology, and supplemental data from Townley and Allen (1939) and the U.S. Geological Survey's earthquake database system, approximately 684 historical earthquakes with magnitude 4.0 or greater were recorded from 1800 through 1996 within a 100 mile radius of the site. A map showing the location of the project site with relation to the approximate historical earthquake epicenter locations is presented on Drawing No. 3. The source data presented include: latitude, longitude, date, time, depth, Magnitude, computed site acceleration, computed site Modified Mercalli intensity, and the approximate earthquake-to-site distance in miles and kilometers. This analysis was performed by a computer program titled EQSEARCH (1989).

An attenuation relationship, developed by Boore et al. (1993), was used to estimate the peak horizontal ground acceleration that may have occurred at the site from each of the historical earthquakes within the 100 mile search radius.

The nearest event (Mag.= 5.0, Acc.= 0.234g) found during the search occurred in 1938 approximately 1 mile southeast of the site. The largest magnitude earthquake identified in the search was the magnitude 8.25, 1906 San Francisco earthquake event occurring approximately 62 miles northwest of the site.

6.2.1.2 Probabilistic Seismic Hazards Analysis: The level of ground motion typically used for design of non-essential commercial developments is the ground motion with a 10% probability of being exceeded in 50 years, which is termed the "maximum probable earthquake". Determination of the Maximum Probable Earthquake requires probabilistic methods.

The computation of attenuated ground motion is based on the closest distance between the site and various measures of potential fault-plane ruptures along selected faults. The twenty (20) faults selected for this analysis are listed on Table No. 1. These selected faults comprise the local potentially active faults and regional faults with higher activity and magnitudes. The computations were conducted using FRISK (McGuire, 1978). FRISKSP version 3.00 programs (Blake, 1995) was used to set up the input data files and generate the output.

TABLE NO. 1
Summary of Fault Source-Model Parameters

FAULT NAME	Site to Fault Distance, Miles	SLIP RATE (millimeters per year)	Upper Bounds Magnitude
Sargent-Berrocal	3	1.0	7.0
San Andreas (Northern)	5	19	8.0
Hayward	8	9	7.0
Calaveras	8.5	7	7.5
San Andreas (Creeping)	10	34	7.0
Greenville	20	0.5	7.3
Monterey Bay Zone	24.5	2	6.0
Ord Terrace	26	0.16	5.5
Rinconada	27	1	7.0
Palo Colorado-San Gregorio	30	10	7.7
Chupines	31	2	6.0
Seaside	31	0.01	5.5
Navy-Turlarcitos	31	0.13	5.5
Ortigalita	31	0.04	7.0
Cypress Point	35	0.01	5.0
Coast Range-Sierran Block	38	3.0	7.0
Las Positas	38	0.2	6.3
Miller Creek-Palomares	41	1.2	6.3
Vernalis	45	0.4	6.5
Concord	59	4	6.7
Antioch	59	1	6.7
Green Valley	73	4	7.0

Fault parameters (such as fault length, magnitude, and rupture area) of faults capable of impacting the site were determined from published geologic papers (see bibliography), and the maximum magnitudes (100 year) were estimated using a characteristic fault model relationship (Youngs and Coppersmith, 1985). Due to the relative age of the faults and the absence of historic event data, subjective probabilities reflecting the relative slip rates reported were applied to account for the questionable activity of potentially active faults. The primary parameters used in the analysis are included in Table No. 1. The location of faults used in this analysis are provided on Drawing No. 4.

The ground motion attenuation relationship used in the analysis to estimate site response values was developed by Boore et al. (1993) for a Class A site (soil). The relationship for the larger component plus one standard deviation (as opposed to mean) was used. Boore et al. (1993) defines a class for each site based on the shear wave velocities of the upper 30 meters of material (about 200 feet). A Class A site has a shear wave velocity of 750 meters per second (m/s) or greater; a Class B site has a shear wave velocity of between 360 m/s and 750 m/s; a Class C site has a shear wave velocity of between 180 m/s and 360 m/s; and a Class D site has a shear wave velocity of less than 180 m/s. Our understanding of the shallow bedrock conditions in the site area suggest the subject site should be classified as a Class A site.

The horizontal site acceleration that has a 10 percent probability of being exceeded in 50 years (maximum credible event) was determined to be about 0.38g. The Probability of Exceedance vs. Acceleration for exposure periods of 25, 50, 75, and 100 years for the site are shown on Drawing No. 5. In addition, the Average Return Period versus Ground Acceleration is shown on Drawing No. 6.

6.2.2 Ground Rupture: Earthquakes are caused by the sudden displacement of earth along faults with a consequent release of stored strain energy. The fault slippage can often extend to the ground surface where it is manifested by sudden and abrupt relative ground displacement. Damage resulting from fault rupture occurs only where structures are located astride the fault traces that move.

The project site is located in a seismically active region with numerous active and potentially active faults. Two subparallel bedrock faults associated with melange terrane have been mapped near the proposed Clubhouse and Overnight Lodges (Wahler Associates, 1990, and Kaldveer Associates, 1989). The locations of these mapped faults are shown on Drawing No. 2 with respect to the proposed facilities. The northern trace is located near the axis of the ravine, north of the clubhouse. The southern fault is located through the area of the Overnight Lodges. According to Wahler (1990) the bedrock faults and sheared zones are apparently an extension of the Ben Trovato fault zone mapped northwest of the site. The Ben Travato Fault is designated as preQuaternary (Jennings, 1994), and is therefore considered inactive. During our geologic field investigation we noted evidence of several northwest-southeast trending faults and/or shear zones delineated based on linear distribution of springs, linear zones of contrasting vegetation, and topographic expressions. Terratech (1988) reported photolineaments in alluvium along inferred fault traces. However, trenching by Wahler (1973) across projections of the lineaments in bedrock areas did not identify evidence of geologically recent fault activity. Wahler (1973) judged both the Hayes Valley Fault and the fault on the north side of the valley (near the subject site) to be inactive.

Data presented in the cited reports of previous investigations do not indicate that the bedrock faults in the site area are active. The nearest mapped active or potentially active fault is the Sargent, located about 3 miles east of the site. The project site is not located in a Fault-Rupture Hazard Zone or former Alquist-Priolo Special Studies Zones. Accordingly, the potential for surface fault rupture at the site is low.

6.2.3 Liquefaction: Liquefaction in this instance describes a phenomenon in which a saturated, cohesionless soil loses strength during an earthquake as a result of induced shearing strains. Lateral and vertical movement of the soil mass, combined with loss of bearing usually results. Research has shown that liquefaction potential of soil deposits induced by earthquake activity depends on soil types, void ratio, groundwater conditions, duration of shaking, and confining pressure over the potentially liquefiable soil mass. Fine, well sorted, loose sand, shallow groundwater conditions, higher intensity earthquakes, and particularly long duration of ground shaking are the requisite conditions for liquefaction.

Studies of liquefaction potential during earthquakes address the liquefaction "susceptibility" and "opportunity" of a given site. Liquefaction susceptibility is a function of the mechanical properties of the underlying soils, particularly grain size distribution and relative density determined from standard penetration blow counts. Liquefaction opportunity expresses the probability of exceeding a critical level of shaking and is described in terms of a function which accounts for peak ground acceleration, or acceleration and duration. Accelerations of at least 0.10g and ground shaking durations of at least 30 seconds are generally required to initiate liquefaction.

The potential for the occurrence of an earthquake with the intensity and duration characteristics capable of promoting liquefaction "opportunity" is considered likely for the project life of the proposed Clubhouse and Overnight Lodges. Considering that granular soils were not identified, and that liquefaction will not occur in areas of very shallow bedrock, the "susceptibility" for liquefaction is considered very low.

6.2.4 Seismic Settlement: Seismic shaking may induce settlement of loose, unconsolidated sediments. This can occur in unsaturated and saturated granular soils. Considering that loose or granular soils were not identified at the site during or field exploration, in conjunction with the shallow depth to bedrock, the potential for seismic induced settlement is considered very low.

7.0 CONCLUSIONS

Based on the data collected during our investigation and our understanding of the anticipated construction, we present the following general conclusions and mitigation measures. Considering the conclusions and mitigation measures, the proposed project is feasible with respect to geotechnical, geologic, and seismic hazards.

7.1 The site appears geologically and geotechnically suitable for the proposed Clubhouse and Overnight Lodges facility considering the conclusions and mitigation measures presented in this report. The geotechnical and geologic issues requiring mitigation are discussed below.

7.2 Soil and rock conditions at the site vary from alluvial soils on the eastern portion of the site to soils developed on colluvium, and residual soils (lean clays) developed on the shallow bedrock on the western (hillside) portions of the site. Soils below the Clubhouse and Pro Shop comprised gravelly and sandy lean clays. Weathered greenstone bedrock was encountered between depths of 7 to 19 feet BSG at the proposed Clubhouse and pro shop sites. Rock was encountered at depths of 2 to 4 feet BSG on the hillside portion of the site.

7.3 Testing of lean clay soils collected from sites near the proposed Clubhouse and Overnight Lodges have been reported to have a low to moderate shrink-swell potential. Lean clay soils at the site may exhibit low to moderate expansion characteristics. To mitigate the potential for structural damage resulting from expansive soils, non-expansive materials can be placed below slabs, and foundations can be extended below the depth where moisture changes in soil cause volumetric changes. This depth is preliminarily estimated to be approximately 36 inches below site grade. To minimize the potential for fluctuations in soil moisture near buildings, grading should be conducted to direct drainage away from the buildings and prevent ponding near the building. Landscaping setbacks can also be instituted to minimize the potential for ponding of water near the foundation.

7.4 As evidenced by springs and seeps, shallow groundwater may be encountered during grading of the hillside slopes.

7.5 Potential erosion and slope stability hazards which may be caused by shallow groundwater at the site can be mitigated by the following methods:

- Road subgrades: Trenched cut-off walls and subdrains
- Native slopes: Upslope trench cut-off wall or horizontal wick drains
- Cut slopes: Retaining wall with filter drain and weep holes
- Fill slopes: Cut-off drains placed in keyways and other locations where subflow impinges on fill slopes.

Subsequent to rough grading, areas with evidence for subsurface groundwater flow should be identified by Twining's civil engineer or engineering geologist. Soil textures exhibiting a selective removal of fine particles from currently dry soils may indicate subsurface groundwater flow during wetter periods. Mitigative measures can be selected by Twining's civil engineer or engineering geologist for specific areas, when adverse shallow groundwater conditions are identified.

7.6 The soils are estimated to have a low erosion hazard. Based on our understanding of the anticipated construction, soil erosion is not expected to significantly affect the project.

7.7 Trenching exploration of the subject site did not reveal evidence of active faults (see section 6.2.2), however, brecciated and sheared zones were noted indicating older (inactive) faults within the greenstone bedrock. These shear zones are typical for Franciscan Complex (melange terrane) materials. Differential settlement across and within an inactive fault zone may occur, and damage may occur to buildings constructed across those zones. Potential differential settlement due to weak shear zones may be mitigated by overexcavation and recompaction of foundation soils over the fault discontinuity, or deep foundations such as drilled shafts or driven piles. In addition, mitigation may include modifying the location of a structure away from the shear zone. Specific foundation recommendations can be provided in the design level geotechnical engineering report.

7.8 Native slopes in the vicinity of the project site appear to be relatively stable and suitable for the proposed construction based on maximum cut and fill slopes of 2 horizontal (H) to 1 vertical (V). Existing landslide features were not noted which could affect the project. Further evaluation of slope stability should incorporate the proposed site grading plan. In addition, Twining's engineering geologist should be contacted to observe soil, rock and associated groundwater conditions revealed after mass grading. If unstable native slopes are encountered, they can be mitigated by removal of the unstable material, buttressing the material, or providing subflow cut-off drains and limiting infiltration of surface water. Cut and fill slopes of not greater than 2 horizontal (H) to 1 vertical (V) can be constructed in accordance with the Uniform Building Code to provide stable foundations for construction. Steeper cut or fill slopes, if required, may be feasible contingent on evaluation on a case-by-case basis.

7.9 The potential to encounter serpentine and asbestos at the project site is low. However, if asbestos containing materials are encountered during grading, the locations should be documented and the asbestos content in the serpentine should be assessed by Twining's engineering geologist. Serpentine rock is typically a green or yellow, highly sheared and altered rock, with a fibrous appearance. Where final graded areas expose asbestos-containing serpentine, or where asbestos-containing fill material is used, the potential for human exposure to asbestos can be mitigated by placing a layer of non-asbestos containing material over the asbestos containing material.

7.10 There is little or no potential for hazards due to volcanic activity, seiches, and tsunamis at the site.

7.11 A maximum probable peak horizontal ground acceleration of 0.38g is estimated for the proposed development site. Building design and construction in accordance with the Uniform Building Code can mitigate the potential effects of the maximum probable peak horizontal ground acceleration estimated for the site.

7.12 Mitigation for potential surface rupture of an active fault typically requires establishing building setbacks. However, trenching exploration of the subject site did not reveal evidence of active faults. The site is not located in a Proposed Seismic Hazard Zone or an Alquist-Priolo Special Studies Zone. Therefore, the potential for ground rupture associated with a known active fault is very low, and building setbacks would not be warranted.

7.11 Based on the soil and rock conditions at the site, the potential for liquefaction and seismic settlement are considered low. Accordingly, it is not anticipated that mitigation of potential liquefaction and seismic settlement would be required. In the event soil conditions susceptible to liquefaction or seismic settlement are revealed during design level geotechnical studies, the potential for liquefaction and seismically induced settlement can be mitigated. Mitigation can be achieved through site preparation, including densifying site soils by either overexcavation and compaction, ground modification techniques, using deep foundation (piles) founded below liquefiable zones, or using reinforced structures.

8.0 NOTIFICATION AND LIMITATIONS

The conclusions presented in this report are based on the information provided regarding the proposed construction, the results of the research of background information, and our evaluation of site conditions revealed during our reconnaissance and subsurface geotechnical engineering investigation. This report does not present design level geologic or geotechnical data.

The focus of our investigation was the proposed Clubhouse and Overnight Lodges area and pertains only to geologic and geotechnical concerns of this site. Potential geotechnical and geologic hazards to structures on or outside of the subject site were not evaluated in this report.

If variations or undesirable conditions are encountered during construction, Twining should be notified promptly so that these conditions can be reviewed and our recommendations reconsidered where necessary. It should be noted that unexpected conditions frequently require additional expenditures for proper construction of the project.

If the proposed construction is relocated or redesigned, or if there is a substantial lapse of time between the submission of our report and the start of work (over 12 months) at the site, or if conditions have changed due to natural cause or construction operations at or adjacent to the site, the conclusions and preliminary recommendations contained in this report should be considered invalid unless the changes are reviewed and our conclusions and recommendations modified or approved in writing.

Changed site conditions, or relocation of proposed structures, may require additional investigations to determine if our conclusions are applicable considering the changed conditions or time lapse.

The conclusions contained in this report are valid only for the project discussed in the "Anticipated Construction" section of this report. The entity or entities that use or cause to use this report or any portion thereof for a structure or site other than those indicated in the "Background" section of this report shall hold Twining, its officers and employees harmless from any and all claims and provide Twining's defense in the event of a claim.

This report is issued with the understanding that it is the responsibility of the client to transmit the information and preliminary recommendations of this report to developers, owners, buyers, architects, engineers, designers, contractors, subcontractors, and other parties having interest in the project so that the steps necessary to carry out these preliminary recommendations in the design, construction and maintenance of the project are taken by the appropriate party.

Reliance on this report by a third party (i.e., that is not a party to our written agreement) is at the party's sole risk. If the project and/or site is purchased by another party, the purchaser must obtain written authorization and sign an agreement with Twining in order to rely upon the information provided in this report for design or construction of the project.

Our professional services were performed, our findings obtained, and our recommendations prepared in accordance with generally-accepted engineering principles and practices in Santa Clara County, California at the time of the investigation. This warranty is in lieu of all other warranties either expressed or implied.

9.0 CLOSING

We appreciate the opportunity to be of service to Lion's Gate Limited Partnership, LLC. If you have any questions regarding this report, or if we can be of further assistance, please contact us at your convenience.

Sincerely,
THE TWINING LABORATORIES, INC.

REGISTERED GEOLOGIST
KENNETH JAMES CLARK
No. EG 1664
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA
EXP 5-31-99

Kenneth J. Clark, CEG
Project Geologist

cc: Mr. Ron Davis, Lion's Gate Limited Partnership, LLC
cc: Mr. Bert Verrips with Nolte Engineering

10.0 REFERENCES

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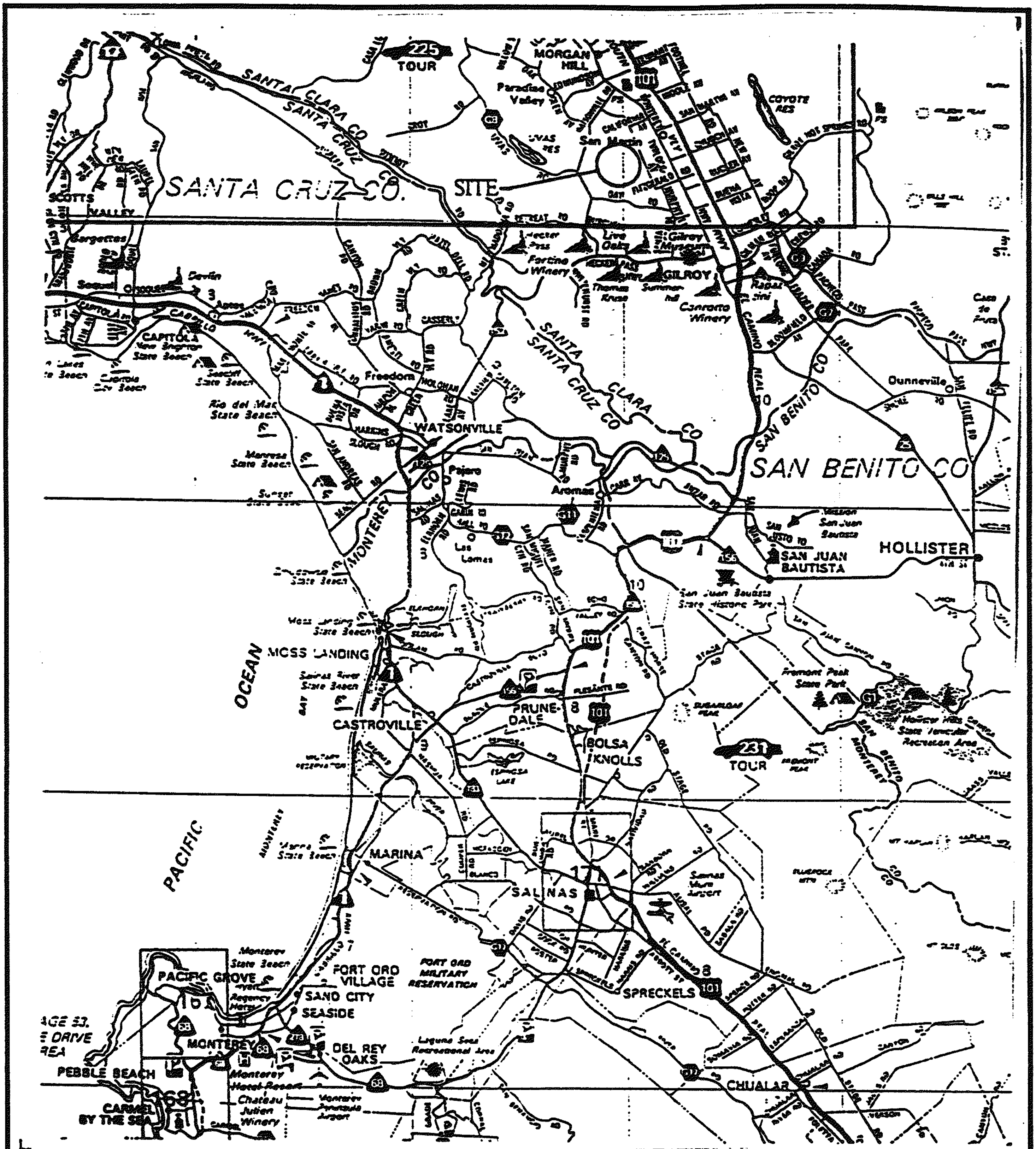

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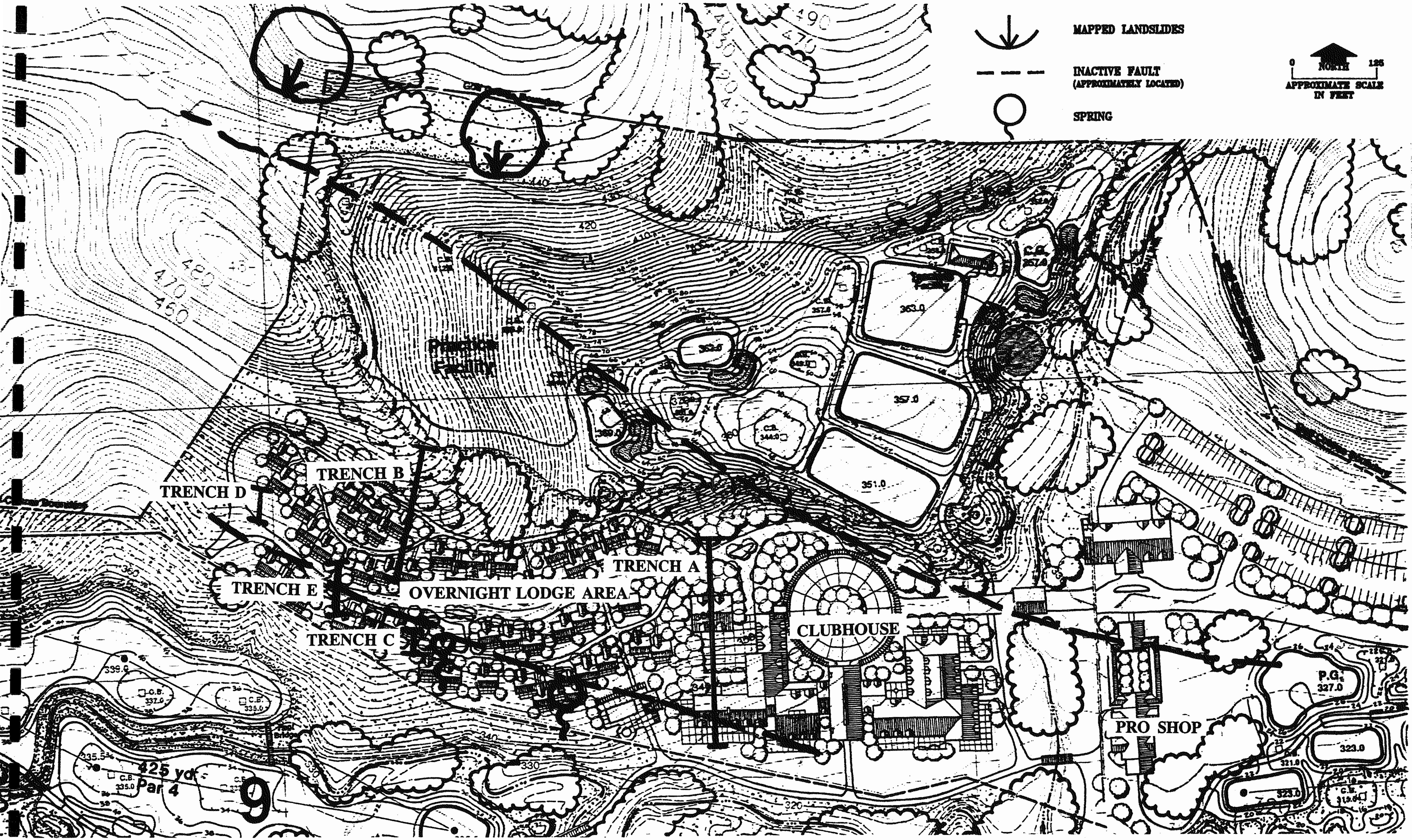

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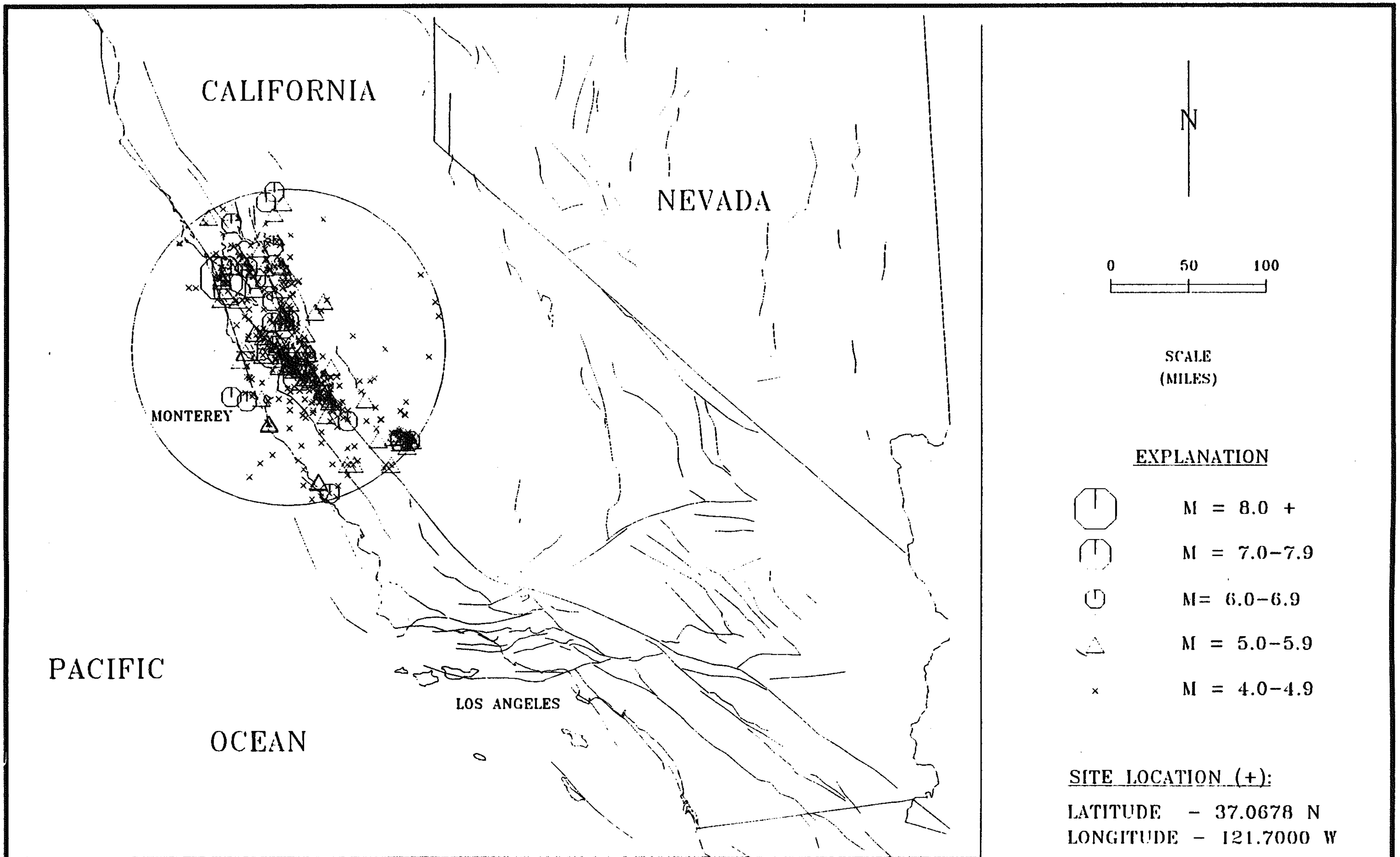
	PROJECT NO.	DRAWING NO.

THE TWINING LABORATORIES, INC.
EST. 1895



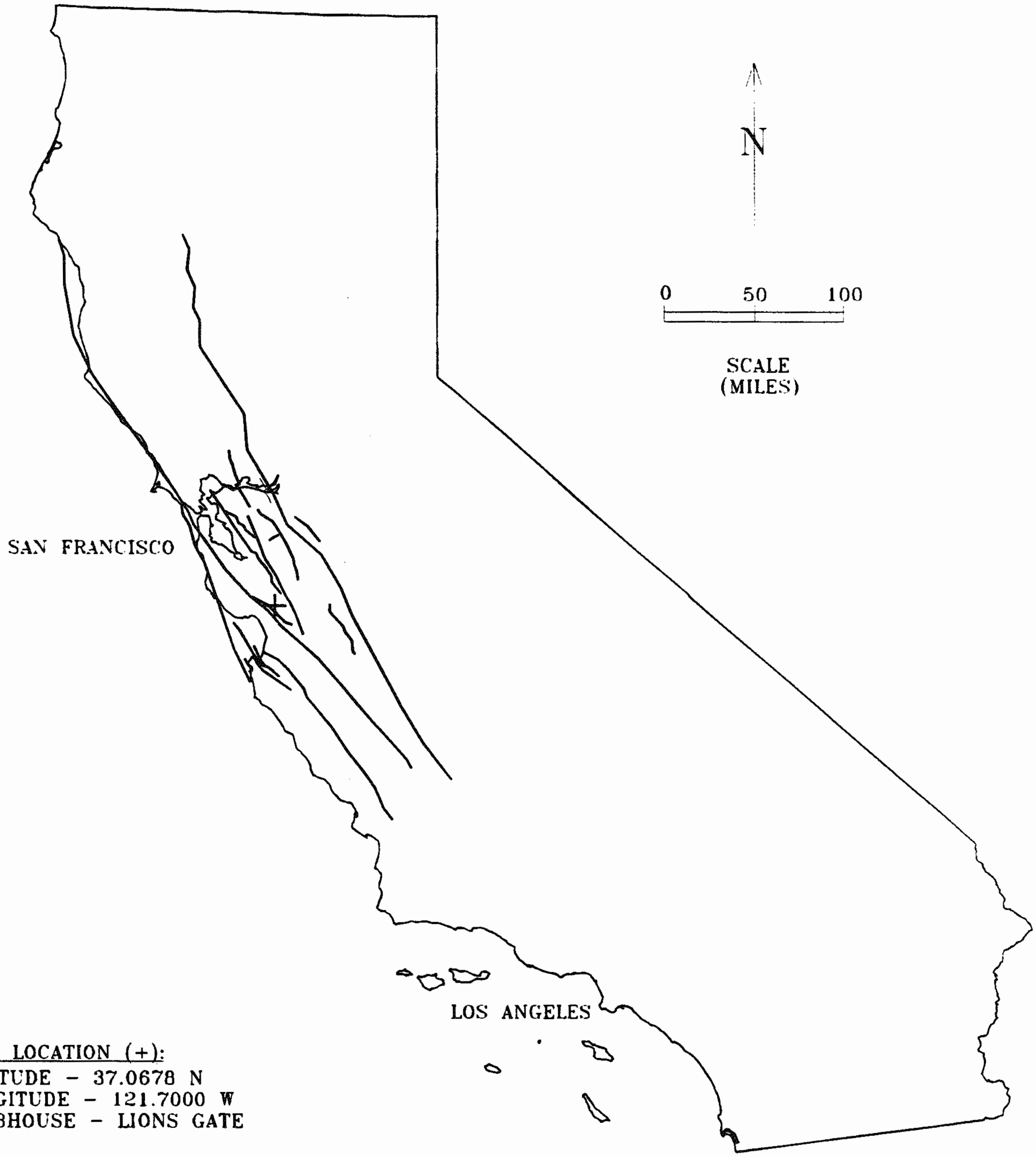
HISTORICAL EARTHQUAKES 1800 TO 1996

JOB NO.: D34301.03

HISTORICAL EARTHQUAKE EPICENTER LOCATION
NEW CLUBHOUSE AND OVERNIGHT LODGES
CORDEVALLE GOLF CLUB AND HOTEL
SAN MARTIN, CALIFORNIA

FILE NO.: 34301-04	DATE: 5-29-98
DRAWN BY: PNG	APPROVED BY:
PROJECT NO. D34301.03	DRAWING NO. 3

THE TWINING LABORATORIES, INC.
FRESNO/MODESTO/VISALIA/BAKERSFIELD/SALINAS
EST. 1898



SITE LOCATION (+):
LATITUDE - 37.0678 N
LONGITUDE - 121.7000 W
CLUBHOUSE - LIONS GATE

FRISKSP FAULT MAP

JOB No: D34301.03

FAULT LOCATION MAP NEW CLUBHOUSE AND OVERNIGHT LODGES CORDEVALLE GOLF CULB AND HOTEL SAN MARTIN, CALIFORNIA	FILE NO.: 34301-03	DATE: 5-29-98	THE TWINING LABORATORIES, INC. EST. 1898 FRESNO/MODESTO/VISALIA/BAKERSFIELD/SALINAS
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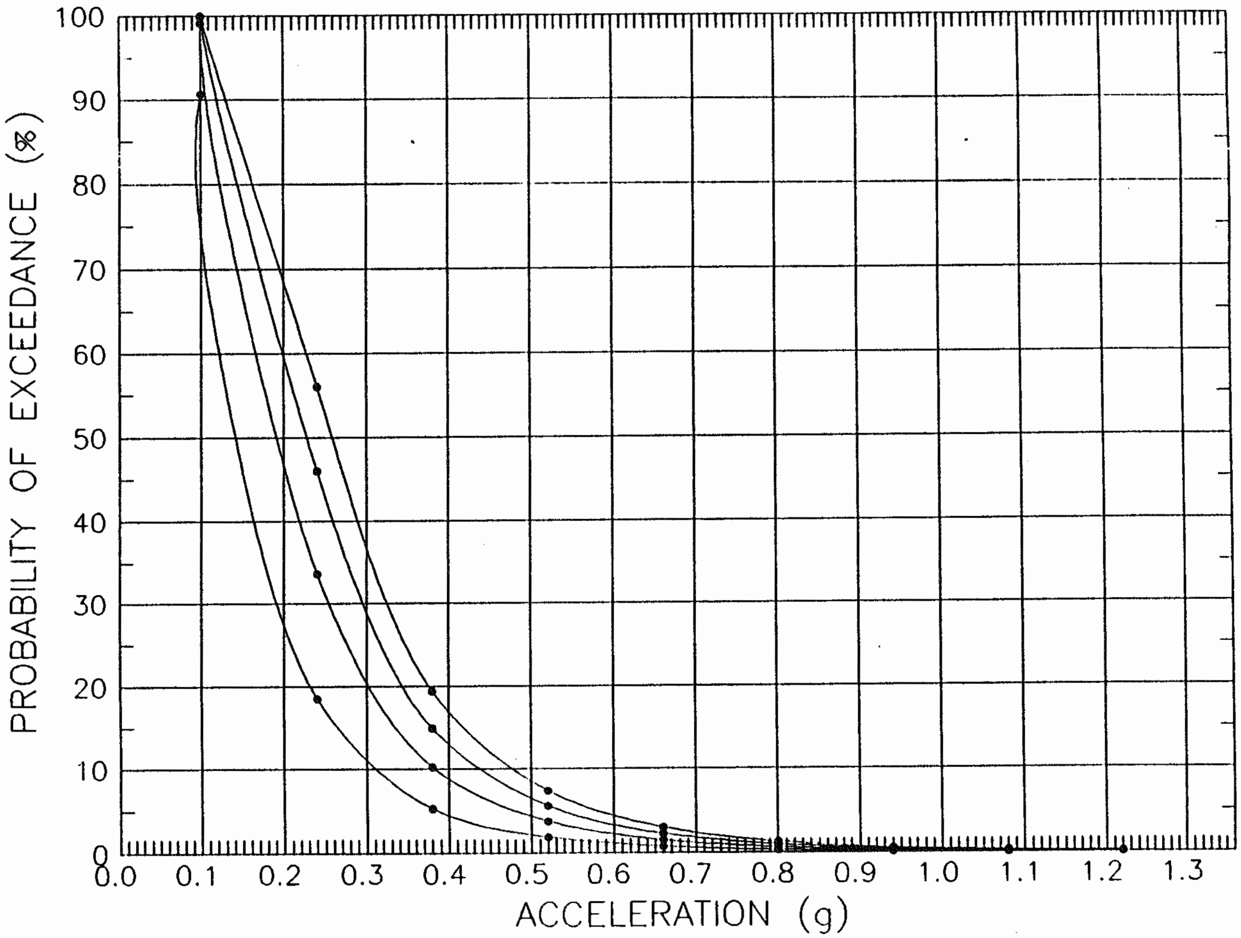
PROBABILITY OF EXCEEDANCE vs. ACCELERATION



BOORE ET AL. (1993) LRG. S – A

EXPOSURE PERIODS:

25 years	75 years
50 years	100 years

JOB No.: D34301.03

PROBABILITY OF EXCEEDANCE vs. ACCELERATION
NEW CLUBHOUSE AND OVERNIGHT LODGES
CORDEVALLE GOLF CLUB AND HOTEL
SAN MARTIN, CALIFORNIA

FILE NO.: 34301-06	DATE: 5-29-98
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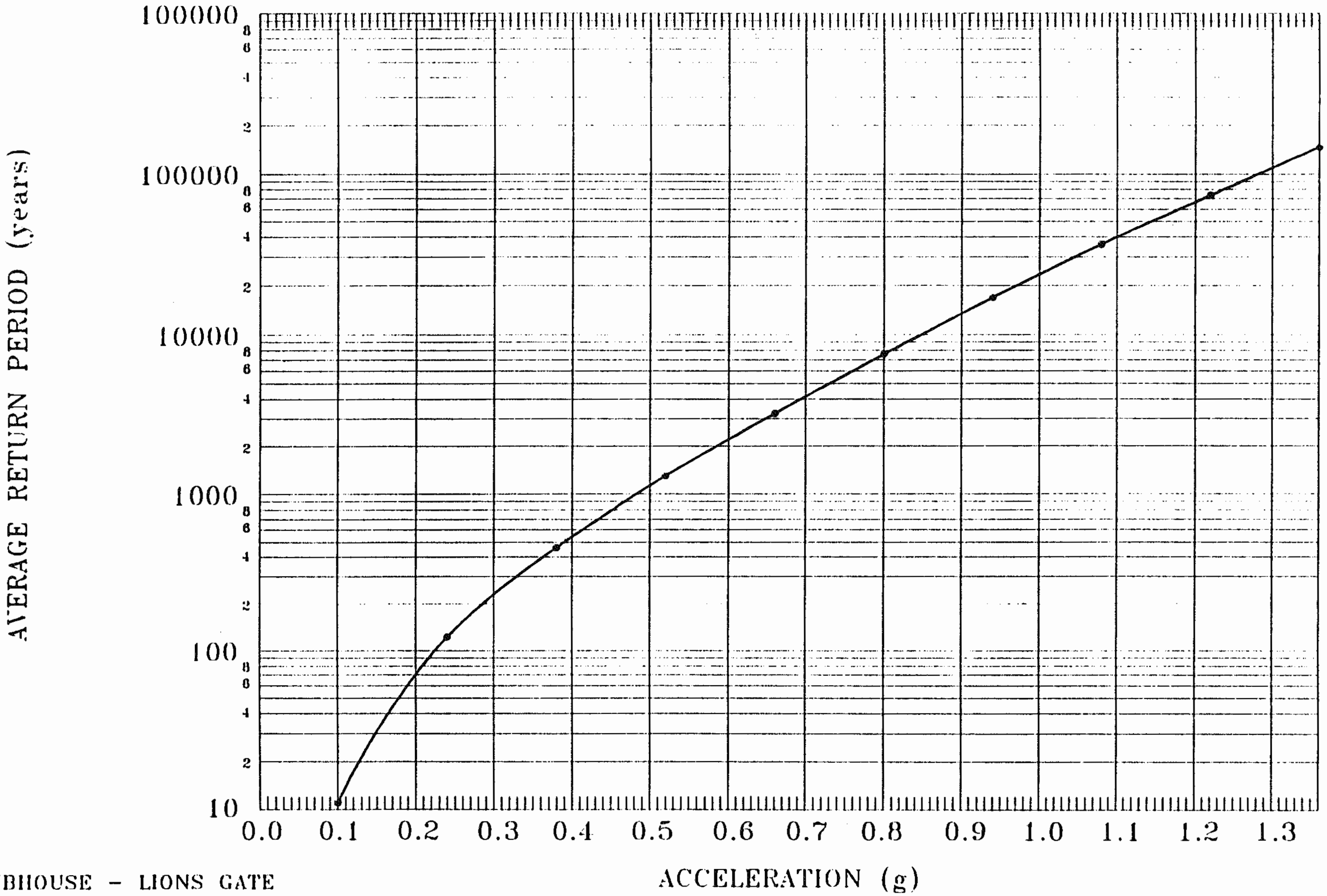
PROJECT NO. D34301.03	DRAWING NO. 5

THE TWINING LABORATORIES, INC.
EST. 1898
FRESNO/MODESTO/VISALIA/BAKERSFIELD/SALINAS

AVERAGE RETURN PERIOD vs. ACCELERATION



CLUBHOUSE – LIONS GATE

BOORE ET AL. (1993) LRG. S – A

JOB No.: D34301.03

AVERAGE RETURN PERIOD vs. ACCELERATION NEW CLUBHOUSE AND OVERNIGHT LODGES CORDEVALLE, GOLF CLUB AND HOTEL SAN MARTIN, CALIFORNIA	FILE NO.: 34301-05	DATE: 5-29-98
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	PROJECT NO. D34301.03	DRAWING NO. 6

THE TWINING LABORATORIES, INC.
EST. 1898
FRESNO/MODESTO/VISALIA/BAKERSFIELD/SALINAS

APPENDIX D

Master Drainage Plan

Prepared by

Pacific Advanced Civil Engineering

January 1998 (with Addendum dated April 1998)

LION'S GATE RESERVE

MASTER DRAINAGE PLAN

Prepared by

PACE

PACIFIC ADVANCED CIVIL ENGINEERING

17902 Georgetown Lane

Huntington Beach, CA 92648

714/843-5734

REGISTERED PROFESSIONAL ENGINEER
SASHA SAVICH
C056094
Exp. 12-31-00
CIVIL
STATE OF CALIFORNIA

Date:

January 1998

Table of Contents

INTRODUCTION

Lion's Gate Reserve, formerly know as Hayes Valley Ranch, is located at the base of Lion's Peak, 11 miles south of San Jose, adjacent to the City of Morgan Hill and approximately 2 miles west of Highway 101. Of the 1,676 acres, only approximately 420 are being developed and are located at the valley floor. The development plan for Lion's Gate Reserve includes a golf course, clubhouse, overnight lodge and 41 executive homes. The West Branch of Llagas Creek, an ephemeral stream, runs east-west through the project.

Pacific Advanced Civil Engineering, Inc. (PACE) has been retained by Hix-Rubenstein Companies to complete a Master Drainage Plan for Lion's Gate Reserve. The scope of this drainage report is to define the drainage area tributary to the project, estimate the flows and design drainage structures necessary to safely convey the flows through the project. Analysis of the golf course has been completed previously and is included in *the Lion's Gate Reserve Golf Course Drainage Report, PACE, May 1997.*

HYDROLOGY

Given the size of the watershed tributary to the project (2.37 square miles), the Corps of Engineers (COE) HEC-1 computer program was used. In general, HEC-1 is better suited for analysis of watersheds over 200 acres than other methods such as the Rational Method. The hydrology portion of this report discusses the drainage sub basin delineation and description, precipitation, soil parameters and routing used in the HEC-1 hydrologic model as well as the resulting flows that were calculated. Two separate models were created: Existing Condition and Developed Condition. The Existing Condition models the watershed under the present undeveloped conditions. The Developed Condition models the watershed assuming full residential and golf course improvements are in place.

Drainage sub-basin delineation

The drainage sub basin boundaries were developed by utilizing a 1"=400' topographic map of the project site as well as a 1"=2000' USGS map to determine any offsite flows that drain through the project site. Exhibit 1, USGS Map, located in the Appendix, shows the offsite drainage sub-basins. Exhibits 2 and 3 show the drainage sub basins for the entire watershed for the existing and developed conditions. The Tables 1 and 2 below list all the drainage basins along with area, time of concentration and Clark Storage coefficient "R" calculations (necessary for the Clark Unit Graph modeling of the drainage sub basins in the HEC-1 model). The equations used in the calculation of time of concentration and Clark storage coefficient were obtained from the Santa Clara County Water District and are shown below:

$$Tc = 0.01377\ L^{0.47}\ N^{0.47}\ S^{-0.235}$$

$$R/(R + Tc) = X$$

Where Tc = time of concentration (in hours)
L = length of drainage sub basin (in feet)
N = overall watershed roughness (resistance to overland flow)
S = drainage sub basin slope (in feet/foot)
R = Clark Storage coefficient (in hours)
X = 0.6 for rural areas

Table 1
Existing Condition Drainage Sub-Basin Description

Sub-basin	Area (mi^2)	Basin Length (ft)	Basin Slope (ft/ft)	Overland Flow Roughness N	Tc (hours)	R (hours)
1	0.1078	2100	0.1500	0.4000	0.5093	0.7639
2	0.0905	2175	0.0667	0.4000	0.6264	0.9396
3	0.0498	1800	0.1139	0.4000	0.5054	0.7580
4	0.2879	3605	0.1148	0.4000	0.6991	1.0487
5	0.0691	3085	0.1378	0.4000	0.6225	0.9337
6	0.1210	3853	0.1376	0.4000	0.6913	1.0369
7	0.1312	3500	0.1871	0.4000	0.6147	0.9221
8	0.0924	2477	0.2806	0.4000	0.4751	0.7126
9	0.0399	1170	0.1154	0.4000	0.4115	0.6172
10	0.1404	3326	0.2315	0.4000	0.5709	0.8563
11	0.0898	3640	0.0810	0.4000	0.7623	1.1434
12	0.1382	2655	0.2203	0.4000	0.5195	0.7793
13	0.0868	2750	0.2691	0.4000	0.5039	0.7559
14	0.0807	2825	0.2088	0.4000	0.5417	0.8125
15	0.0787	2200	0.0318	0.4000	0.7495	1.1242
16	0.0776	2940	0.1810	0.4000	0.5708	0.8562
17	0.1281	4050	0.0770	0.4000	0.8111	1.2167
18	0.1542	2530	0.1420	0.4000	0.5631	0.8446
19	0.0423	3000	0.1090	0.4000	0.6429	0.9737
20	0.3678	3870	0.1320	0.4000	0.6995	1.0493

Table 2
Developed Condition Drainage Sub-Basin Description

Sub-basin	Area (mi^2)	Basin Length (ft)	Basin Slope (ft/ft)	Overland Flow Roughness N	Tc (hours)	R (hours)
1	0.1078	2100	0.1500	0.3500	0.4783	0.7175
2	0.0905	2175	0.0667	0.4000	0.6264	0.9396
3	0.0498	1800	0.1139	0.3500	0.4746	0.7119
4	0.2879	3605	0.1148	0.3750	0.6782	1.0174
5	0.0691	3085	0.1378	0.3500	0.5846	0.8769
6	0.1210	3853	0.1376	0.3750	0.6706	1.0059
7	0.1312	3500	0.1871	0.3750	0.5964	0.8945
8	0.0924	2477	0.2806	0.3750	0.4609	0.6913
9	0.0399	1170	0.1154	0.3500	0.3864	0.5797
10	0.1404	3326	0.2315	0.4000	0.5709	0.8563
11	0.0898	3640	0.0810	0.3250	0.6914	1.0371
12	0.1382	2655	0.2203	0.4000	0.5195	0.7793
13	0.0868	2750	0.2691	0.3750	0.4889	0.7333
14	0.0807	2825	0.2088	0.3750	0.5255	0.7882
15	0.0787	2200	0.0318	0.3250	0.6798	1.0197
16	0.0776	2940	0.1810	0.3750	0.5537	0.8306
17	0.1281	4050	0.0770	0.4000	0.8111	1.2167
18N	0.0779	2530	0.1420	0.4000	0.5631	0.8446
18S	0.0763	2530	0.1420	0.4000	0.5631	0.8446
19	0.0423	3000	0.1090	0.2500	0.5205	0.7807
20	0.3678	3870	0.1320	0.2500	0.5609	0.8413

Precipitation

Per the *Santa Clara County Drainage Manual*, for watersheds between 200 and 2560 acres, the minimum return period for a design storm is 10 years. *Technical Paper No. 40, Rainfall Atlas of the United States, US Weather Bureau, US Department of Commerce* lists the following precipitation depths for the area.

Table 3
Rainfall Depths for Storms of Various Return Periods

Storm	Total Rainfall (in)
2 year 24-hour storm	3
5 year 24-hour storm	4
10 year 24-hour storm	5
25 year 24-hour storm	6
50 year 24-hour storm	7
100 year 24-hour storm	8

The rainfall distribution used in the HEC-1 modeling is the based on the C.O.E. standard storm.

Soils

Soil Conservation Service Soils Map for Santa Clara County indicates that the soils in the area consist of predominantly: Gilroy, Garretson, Keefers and Los Robles. *Technical Release 55, Urban Hydrology for Small Watersheds by Soil Conservation Service, US Department of Agriculture* lists these soils as belonging to hydrologic soil groups C and D. Group D soils have high runoff potential. They have very low infiltration rates when thoroughly wetted and consist chiefly of clay soils with high swelling potential, soils with permanently high water table, soils with claypan or clay layer near the surface, and shallow soils over nearly impervious material. These soils have a very low rate of water transmission (0.0-0.5 in/hr). Group C soils have a slightly lower runoff and higher infiltration rates than group D soils. Each drainage sub basin was analyzed for the soil group. The highest runoff soil group present in the sub-basin was conservatively selected as representative for the entire sub basin.

HEC-1 modeling for the watershed requires the use of SCS Curve numbers for description of the individual drainage basins within the watershed. Per *Table 5-2(a) Runoff Curve numbers for Urban Areas, Engineering Hydrology by Victor Miguel Ponce*, golf courses on group C soils with grass cover greater than 75% are considered to have an SCS curve number of 74. *Table 5-2(d) Runoff Curve Numbers for Arid and Semi Arid Rangelands* for herbaceous, mixture of grass, weeds and low growing brush with more than 70% ground cover on group C soils also have a SCS Curve number of 74. Group D soils have an SCS curve number of 85. Table 3 below lists the SCS curve numbers that were assigned to the various drainage sub basins. All areas were assumed to be 5% impervious for the existing condition. Drainage sub basins which will contain residential development and club house are assumed to be 15% impervious. For all storms events except the 100 year 24 hour storm, antecedent moisture condition AMC II (average soil moisture level) was used. For the 100 year 24 hour storm event, AMC III (wet condition) was used. The AMC III increased the SCS curve numbers from 74 and 85 to 88 and 94 respectively. Higher SCS curve numbers generate higher runoff.

Table 4
Existing Condition Soil Description

Drainage Sub Basin	Hydrologic Soils Group	Existing SCS Curve Number	AMC III Existing SCS CN	Existing Percent Impervious
1	D	85	94	5
2	D	85	94	5
3	C	74	88	5
4	D	85	94	5
5	D	85	94	5
6	D	85	94	5
7	C	74	88	5
8	C	74	88	5
9	C	74	88	5
10	C	74	88	5
11	C	74	88	5
12	C	74	88	5
13	C	74	88	5
14	C	74	88	5
15	C	74	88	5
16	C	74	88	5
17	C	74	88	5
18	D	85	94	5
19	D	85	94	5
20	C	74	88	5

Table 5
Developed Condition Soil Description

Drainage Sub Basin	Hydrologic Soils Group	Developed SCS Curve Number	AMC III Existing SCS CN	Existing Percent Impervious
1	D	85	94	15
2	D	85	94	5
3	C	74	88	5
4	D	85	94	5
5	D	85	94	5
6	D	85	94	5
7	C	74	88	5
8	C	74	88	5
9	C	74	88	5
10	C	74	88	5
11	C	74	88	5
12	C	74	88	5
13	C	74	88	5
14	C	74	88	5
15	C	74	88	15
16	C	74	88	15
17	C	74	88	5
18N	D	85	94	15
18S	D	85	94	15
19	D	85	94	15
20	C	74	88	25

Channel Routing

Runoff flows from the drainage basins were routed using the Storage Routing procedure in the HEC-1 models. Table below shows the routing parameters used in the HEC-1 model for various reaches.

Table 6
Channel Routing Parameters

Reach	Length (ft)	Slope (ft/ft)	Manning's n	Bottom width (ft)	Side Slope (H:V)
RO5	600	0.0333	0.030	20	5:1
RO7	1050	0.0140	0.030	10	5:1
RO11	1440	0.0086	0.030	10	5:1
RO10-1	2620	0.0267	0.035	20	5:1
RO10-2	3600	0.0333	0.035	15	5:1
RO9	800	0.0125	0.030	25	5:1
RO3	1000	0.0400	0.035	20	5:1
RO15	1450	0.0138	0.030	15	5:1
RO13	2500	0.0280	0.035	20	5:1
RO14	2150	0.0279	0.035	20	5:1
ROCP16	1770	0.0056	0.030	20	5:1

Flows

HEC-1 models for both the existing condition and developed condition were completed for storm events ranging from the 2 year 24 hour to the 100 year 24. Differences between the existing and developed condition models include:

1. Percent impervious
2. Time of concentration Tc and Roughness R
3. SCS curve numbers
4. Inclusion of detention areas

Runoff from each of the drainage sub basins is summarized in the table below for both existing and developed conditions for the 100 year 24 hour design storm.

Table 7
Runoff From Individual Drainage Sub-Basins for the 100 year 24 hour storm event for the Existing and Developed Conditions

Drainage Sub Basin	Existing Condition Peak Runoff (cfs)	Developed Condition Peak Runoff (cfs)
SUB1	54	54
SUB2	42	42
SUB3	24	24
SUB4	128	129
SUB5	32	33
SUB6	54	54
SUB7	59	60
SUB8	45	46
SUB9	20	20
SUB10	65	65
SUB11	38	39
SUB12	66	66
SUB13	42	42
SUB14	38	38
SUB15	34	34
SUB16	36	37
SUB17	54	54
SUB18	74	n/a
SUB18N	n/a	37
SUB18S	n/a	37
SUB19	19	21
SUB20	159	173

Peak flows in the various reaches are summarized in the table below.

Table 8
Flows in various Channel Reaches for the 100 year 24 hour storm

Reach	Existing Condition Peak Flow (cfs)	Developed Condition Peak Flow (cfs)
RO5	81	82
RO7	268	271
RO11	311	314
RO10-1	64	64
RO10-2	64	64
RO9	479	469
RO3	41	41
RO15	563	551
RO13	40	40
RO14	37	37
ROCP16	678	649
RO19	764	730

HYDRAULICS

Rainfall runoff from the project site exits the property at three locations: 1) South-east corner of the site across Turlock Avenue, 2)Llagas Creek and 3) across Coolidge Avenue north of Llagas Creek. The hydraulics section of this report analyzes the flows in the West Branch of Llagas Creek and the flows leaving Lion's Gate under existing and developed conditions.

Existing Condition

Under the existing condition, rainfall runoff confluences in two major locations: 1)West branch of Llagas Creek and 2) south-east corner of the project site. Exhibit 4 located in the Appendix shows the 100 year water surface at the project site under existing conditions.

West Branch of Llagas Creek

Flows in the West Branch of Llagas Creek traverse the middle of the project in a west to east direction. As flows reach the eastern project boundary at Coolidge Avenue, they pass under the road through a 3.5' x 6' reinforced concrete box culvert. Since the culvert is relatively small compared to the incoming 100 year flow, the creek backs up submerging the culvert and overtopping the northern bank of the channel and flooding the orchard located just north of the channel. As the flow ponds up in the orchard, it crosses Coolidge Avenue at a dip section located approximately 1,200' north of the creek. The dip section in the road has a 24" reinforced concrete pipe culvert to convey the smaller nuisance flows under the road.

To correctly assess the extent of the ponding and flooding under a 100 year storm event several different calculation and modeling procedures were completed. A HEC-RAS model was completed for the creek. Output from model (Lion8.prj) including cross-sections, profile and summary table are included in the Appendix. Since the culvert at the end of the channel has insufficient capacity to convey all of the 100 year flow (783 cfs), and from recent storm events it is known that that the creek does not overtop the road at the box culvert it, was necessary to determine the maximum flow through the culvert. The HEC-RAS model was used to calculate a rating table of water surface elevation versus flow for the culvert. The rating table is included in the Appendix. A flow of 110 cfs was assumed to pass through the culvert with the remaining 673 cfs overtopping the bank and entering the orchard. The flows that enter the orchard pond up and overtop Coolidge Avenue at the dip section some 1,200 feet to the north. It was then necessary to determine the extent of the flooding and ponding in this area. To determine the flow depth and width across Coolidge Avenue a rating table was developed. The road centerline profile was input into Flowmaster (Manning's Equation) and a critical depth and top width were calculated for various flow rates. The correct flow rate was then looked up in the HEC-1 model which includes the diversion from the creek, flows tributary to that area as well as storage effects from ponding. A flow of 797 cfs crosses Coolidge Avenue at the dip section. This flow was then looked up in the rating table which shows that the flow would be over 1,050' wide and over 6" deep.

Southeast corner of Project Site

The south east corner of the project site is a low point and the natural drainage path for the rainfall runoff of drainage sub-basin 20. As the flows pond up in the corner they enter a 16" corrugated metal pipe which coveys the flows from the project site. The flows then enter 2 12" pipes that convey the flows under Turlock Avenue. Since the 100 year flow expected in this area is 161 cfs, which is more than the capacity of the pipes, the road is overtopped. To determine the flow depth and width across Turlock Road, a rating table was developed. The road centerline profile was input into Flowmaster (Manning's Equation) and a critical depth and top width were calculated for various flow rates. The correct flow rate was then looked up in the HEC-1 model which includes the storage effects from ponding. A flow of 161 cfs crosses Turlock Road at the dip section. This flow was then looked up in the rating table which shows that the flow would be over 250' wide and 5" deep.

Developed Condition

In order to mitigate the problem of flooding and ponding at the project site, it was decided that the flows needed to be controlled and detained. A diversion channel, a detention basin and lake are proposed. These structures are intended to minimize the extent of flooding within the project boundaries as well as reduce the extent of flooding across Coolidge Avenue and Turlock Road, that exists under the present conditions. The natural flow path of the creek remains, as well as the natural crossings leaving the project site. Exhibit 5 located in the Appendix shows the proposed drainage structures as well as the 100 year water surface under developed conditions.

West Branch of Llagas Creek

As under the existing condition, the West Branch of Llagas Creek is the main runoff conveyance system for the project. To mitigate the problem of flooding at the orchard which presently exists, a diversion channel is proposed to parallel the creek. Since a road is proposed to cross the creek at approximately station 21+13, only 2 24" pipes are proposed to be placed there. The remainder of the flow is expected to cross under the road further south through a larger culvert, and parallel the creek. The proposed culvert is a concrete arch bridge with a 24' span and 8' rise. The creek is to remain as is, and will continue to covey flows during all storm events. The difference is that the flows during larger storm events will be lower. The proposed diversion channel is to be trapezoidal with 3:1 side slopes, a bottom width of 10', and be grass lined. The diversion channel and the creek confluence at the culvert at Coolidge Avenue. Since the Coolidge Avenue culvert is not capable of conveying the runoff from larger storm events, a side spillway is proposed to route the flows north, into the proposed Coolidge Detention Basin. The spillway is set at elevation 272.7 and is 200' in length. The calculated depth of flow over the spillway is 1.1'. Calculations are included in the Appendix. The maximum water surface in the detention basin is set at elevation 273' allowing for a 25% submergence of the weir. The detention basin outflow is through a 18" low flow outlet pipe and a 83' spillway set at elevation 271'. The detention basin outlets at the dip section at Coolidge Avenue where it leaves the project site. The basin is designed to intercept the diverted flows from the creek as well as flows from drainage sub-basin 18S. Flows from drainage sub-basin 18N go around the northern edge of the detention basin, to the dip section at Coolidge Avenue, where they confluence with the outflow from the basin. These flow paths are included in the developed condition HEC-1 model dev100.hc1 located in the Appendix. The detention basin design is summarized in the table below.

Table 9
Coolidge Avenue Detention Basin Summary Table

Storm Event	Peak Inflow (cfs)	Peak Outflow (cfs)	Peak Storage (AF)	Peak Stage (feet)
100-year storm	674	663	23	273.00
10-year storm	261	254	18	272.03
2-year storm	63	15	9	269.70

The table shows that only a minor reduction in flow across the road is attained for the 10 and 100 year storms. The significant reduction in flows leaving the property over Coolidge avenue will be achieved for storm events more frequent than the 10 year storm.

To obtain a water surface profile for the West Branch of Llagas Creek a HEC-RAS model was completed. The model includes the proposed diversion channel. Output from the HEC-RAS model lion14.prj including profile, cross-sections and summary table are included in the Appendix.

Since the peak flow over Coolidge Avenue is known, the rating table for the Coolidge avenue crossing was consulted and the flow depth and width over the road was obtained. The flow was found to be 753 cfs with a flow top width of over 1,050' and depth of over 6".

Southeast Corner of Project Site

The natural flow path of drainage sub-basin 20 continues to be the south east corner of the project site under developed condition. The developed condition includes a 16 acre lake which serves as a detention basin. The normal water surface for the lake is set at elevation 275' with the 100 year water surface set at elevation 277.99'. The lake has a peak storage of 50 acre feet. Flows leave the lake over a 54' spillway set at elevation 277' and enters a swale which conveys the flow to the southeast corner of the project. The spillway has a 2' notch set at elevation 275.5' to allow the lake to empty to within 6" of its normal water surface following a storm. The swale itself has a minor flow attenuation effect as the flows pond up in the southeast corner prior to leaving the project site. The swale has a 15' spillway set at elevation 276'and a 16" RCP for a low flow outlet set at elevation 272'.Both the lake and swale are included in the developed condition HEC-1 model dev100.hc1 which is included in the Appendix. Tables 10 and 11 summarize the flow through the lake and swale.

Table 10
Lake Summary Table

Storm Event	Peak Inflow (cfs)	Peak Outflow (cfs)	Peak Storage (AF)	Peak Stage (feet)
100-year storm	173	144	50	277.99
10-year storm	85	41	40	277.43
2-year storm	40	6	25	276.53

Table 11
Swale Summary Table

Storm Event	Peak Inflow (cfs)	Peak Outflow (cfs)	Peak Storage (AF)	Peak Stage (feet)
100-year storm	144	128	22	277.96
10-year storm	41	28	11	276.49
2-year storm	6	6	0	272.69

Since the storage volume available in the lake and swale is small when compared to the volume of the incoming 100 year storm event, only a small reduction in peak flow is attained. However, the 10 and 2 year storm event peak flows are reduced by 67% and 85% respectively. Once the flow out of the swale was calculated, the rating table for the Turlock Road dip section was consulted for the flow top width and depth. The 100 year flow top width calculated was 250' with a maximum flow depth of about 4".

SUMMARY

The purpose of this drainage report is to quantify and characterize the storm runoff flows through the project site under present conditions, and design the drainage structures necessary to minimize onsite flooding and eliminate any increase in runoff leaving the project site as a result of development. The drainage infrastructure proposed includes a diversion channel to divert larger flows from the West Branch of Llagas Creek and route them through the proposed Coolidge Avenue Detention Basin eliminating flooding in the orchard and reducing the flow over Coolidge Avenue. Also included is a lake which intercepts and detains flows from drainage sub-basin 20 and reduces the flows crossing Turlock Road. The natural drainage paths for storm runoff that leave the project site remain in place. Given the large volume of the 10 and 100 year storm events in comparison to the available storage volume in the proposed lake and Coolidge Detention Basin, only a minor flow attenuation is obtained for these storm events. For more frequent storm events the reduction in flow is much more significant. The table below compares the flows leaving the property between the existing and developed conditions for the 2, 10 and 100 year storm events.

Table 12
Comparison of Existing and Developed Discharges Leaving the Property

	Existing Condition			Developed Condition			
	Flow (cfs)	Top Width of flow over road (ft)	Depth of flow over road (ft)	Flow (cfs)	Top Width of flow over road (ft)	Depth of flow over road (ft)	Percentage Flow Reduction
Coolidge Avenue Dip Section							
100 year	797	1050+	0.6	753	1050+	0.6	6%
10 year	332	980	0.4	294	800	0.4	11%
2 year	86	290	0.2	32	150	0.1	63%
Coolidge Avenue Box Culvert							
100 year	110	n/a	n/a	110	n/a	n/a	0%
10 year	110	n/a	n/a	110	n/a	n/a	0%
2 year	110	n/a	n/a	110	n/a	n/a	0%
Turlock Avenue Dip Section							
100 year	161	260	0.4	128	245	0.3	20%
10 year	73	210	0.3	28	110	0.1	62%
2 year	31	120	0.2	6	n/a	n/a	81%

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NOTE

The technical appendices and full scale exhibits of the Master Drainage Plan are not included in this EIR Addendum. These are contained in the full Master Drainage Plan document which is available for review at the County of Santa Clara Advance Planning Office.

ADDENDUM TO LION'S GATE RESERVE MASTER DRAINAGE PLAN

Prepared by

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Date

April 1998

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Table Of Contents

I. Introduction

This addendum to the Lion's Gate Master Drainage Plan (MDP), December 1997, covers the design of the A Street and Highland Avenue Bridges, as well as the design of the diversion structure. The analysis and design of these structures was not included in the original MDP. The hydraulic models included in this addendum supersede all hydraulic models in the MDP, and are to be considered final. Also included in this addendum are calculations for golf course drainage piping.

II. Diversion Structure

The proposed diversion structure, to be located approximately between stations 2449 and 2180, serves to divert a portion of the flow from the existing creek into the proposed diversion channel. The diversion channel parallels the existing creek through the orchard. The proposed diversion channel was necessary to mitigate the flooding problems resulting from the existing creek's insufficient conveyance capacity, in the area of the orchard. Major storm event flows regularly overtop the creek banks and flood the orchard. The design of the diversion channel is included in the main body of the Lion's Gate Master Drainage Plan. The design of the diversion structure is included in this addendum.

For environmental reasons, the existing creek will still convey flows during all storm events. The diversion structure serves to divert major flows from the existing creek into the proposed diversion channel, thereby eliminating flooding in the orchard area. This mitigation was accomplished by proposing two separate structures. First, at the A Street crossing, two 24" reinforced concrete pipes serve as a culvert and convey the flows under A Street to the existing creek during all storm events. The culvert, due to its relatively small conveyance capacity, also serves to back up the water in the West Branch of Llagas Creek, upstream of A Street. This backwater effect forces the water to spill over the side weir spillway diversion structure, into the proposed diversion channel. This proposed diversion structure is a side spillway, to be constructed as a rip rap reinforced berm, with the top of spillway set at elevation 279'. The expected water surface in this area is 283'. Plan and cross-section views of the proposed diversion structure are shown on Exhibit 4. The spillway is to be 75' in length. To verify that the spillway has a sufficient capacity to convey the flows, a weir calculation is included in the Appendix.

III. Bridges

The design of the A Street and Highland Avenue Bridges is included in this section of the addendum. The design was completed utilizing the HEC-RAS computer program. The hydraulic model used in the Lion's Gate Master Drainage plan was modified to include the two proposed bridges. Output from the HEC-RAS computer model (Lion15.prj) including a summary table, profile and cross-sections is included in the Appendix. To accurately size the bridges, scour calculations were also completed. The bridge design is summarized in the table below. The proposed bridges are cast-in place concrete arch bridges by Con Arch, Inc. A minimum of 2 feet of freeboard is provided between the water surface and bridge soffit.

	Highland Avenue Bridge	A Street Bridge
Station	3728	2161
Channel Invert Elevation	287.91	276.73
Calculated Bridge Scour (feet)	4.5	6.3
Bridge Footing Elevation	283.5	270.50
Flow Depth (feet)	3.26	6.3
Calculated Water Surface Elevation	291.17	282.01
Proposed Bridge Arch Height & Span	14.5 x 42	13.5 x 24
Bridge Soffit Elevation	298	284
Roadway Elevation	301	287
Available Freeboard (feet)	6.83	2.00

IV. GOLF COURSE DRAINAGE PIPING

The overall grading and pipe placement for the golf course was designed by the architect, Robert Trent Jones II, to convey nuisance flows through the course to the West Branch of Llagas Creek. Sizing of the pipes was completed by PACE and is summarized by the following:

For flow analysis of the golf course drainage pipes, both HEC-1 and the rational method was utilized. Tributary areas to each pipe inlet were determined. If the tributary area to a pipe corresponded to one of the drainage sub-basins delineated for the HEC-1 model, then the flows from the model were utilized to size the pipe. Otherwise, per the Santa Clara County Drainage Manual the following equation was used:

$Q = RCIA$

Where R = 1 (Table 6)
Assuming a 100-year design storm
I = 1.75 (per Figure 10)
C = 0.2 + 0.15 + 0.05 + 0.1 = 0.5 (per Table 4)
A = drainage area in acres

The equation simplifies to $Q = 0.875$ A.

Using Mannings Equation, pipe sizes were determined based on the assigned flows and the slopes. All pipes were designed to be partially full.

Piping Calculation Summary

Pipe Num.	Trib. Area (acres)	100-Yr. Flow (cfs)	Pipe Dia. (in)	Num. of Inlets	Inlet Size (in)	Slope (ft/ft)	Depth of Flow (ft)	Velocity (ft/s)
1	36.00	31.50	24	-	-	0.056	0.94	21.60
2	0.61	32.03	24	1	10	0.025	1.22	15.96
3	9.03	7.90	15	3	18	0.012	0.90	8.37
4	2.73	10.29	18	2	12	0.010	0.97	8.49
5	2.01	12.05	18	1	12	0.010	1.09	8.72
6	5.99	5.25	12	2	18	0.088	0.43	16.32
7	1.86	6.87	15	1	12	0.030	0.60	11.68
8	1.03	7.77	15	1	12	0.008	1.07	6.96
9	2.86	2.50	12	1	18	0.061	0.32	11.66
10	1.32	3.66	12	1	12	0.050	0.41	12.05
11	10.03	193.18	2-36	-	-	0.025	1.86	21.01
12	2.02	182.19	2-36	-	-	0.025	1.79	20.75
13	97.34	174.42	2-36	-	-	0.025	1.67	20.27
14	3.15	89.25	36	-	-	0.020	1.90	18.92
15	98.85	86.49	36	-	-	0.017	1.97	17.62

16	1.47	1.29	8	1	12	0.070	0.26	10.50
17	0.92	2.09	8	1	12	0.029	0.45	8.43
18	1.18	3.12	10	1	12	0.020	0.55	8.16
19	8.76	10.79	18	-	-	0.025	0.75	12.22
20	2.53	2.21	10	-	-	0.040	0.36	9.78
21	3.04	2.66	10	1	12	0.017	0.52	7.35
22	0.20	2.84	10	1	8	0.018	0.54	7.67
23	0.53	3.30	10	1	8	0.022	0.55	8.57
24	0.63	3.85	12	1	8	0.035	0.47	10.71
25	1.12	4.83	12	1	10	0.013	0.76	7.57
26	0.69	0.60	6	1	10	0.010	0.35	4.15
27	0.28	0.85	8	1	8	0.025	0.27	6.45
28	4.11	3.60	12	-	-	0.018	0.55	8.20
29	1.74	1.52	8	1	12	0.011	0.51	5.31
30	2.83	4.00	12	2	12	0.010	0.72	6.64
31	0.64	4.56	12	1	10	0.010	0.81	6.72
32	2.39	2.09	12	1	12	0.018	0.40	7.13
33	3.50	13.85	18	-	-	0.025	0.87	12.97
34	1.44	15.11	24	-	-	0.030	0.75	14.13
35	8.65	7.57	15	2	18	0.042	0.58	13.54
36	0.71	8.19	15	1	10	0.032	0.66	12.46
37	7.38	49.47	30	-	-	0.057	1.08	24.32
38	2.13	51.34	30	1	12	0.030	1.33	19.31
39	2.42	2.12	10	1	12	0.024	0.41	8.01
40	1.42	1.24	8	1	12	0.020	0.35	6.59
41	1.39	4.58	12	1	12	0.015	0.68	8.04
42	38.93	34.83	24	-	-	0.067	0.95	23.69
43	0.87	0.76	6	1	10	0.190	0.17	13.29
44	0.92	0.81	8	1	10	0.045	0.22	7.87
45	16.96	14.84	18	-	-	0.142	0.55	25.18
46	14.91	29.62	24	-	-	0.090	0.80	25.31
47	1.98	16.58	18	1	12	0.075	0.70	20.93
48	0.53	0.46	8	1	8	0.009	0.26	3.70
49	0.42	0.37	8	1	8	0.043	0.15	6.19
50	0.36	1.15	10	1	8	0.032	0.27	7.55
51	0.38	0.32	6	1	8	0.051	0.15	6.50
51A	-	20.00	21	-	-	0.058	1.29	10.53
52	0.67	20.90	21	1	8	0.023	1.05	13.91
53	1.44	23.31	24	1	12	0.016	1.37	10.15
54	0.49	0.43	6	1	8	0.036	0.19	6.22
55	3.57	26.86	30	2	12	0.010	1.26	10.88
56	1.29	1.12	8	1	10	0.053	0.25	9.14
57	0.65	27.42	30	1	10	0.010	1.27	10.94
58	0.90	29.35	30	1	10	0.010	1.32	11.12
59	0.62	0.55	6	1	8	0.020	0.26	5.34
60	0.84	0.74	6	1	10	0.010	0.42	4.23
61	0.41	0.35	6	1	8	0.013	0.23	3.99
62	0.84	0.73	6	1	10	0.012	0.38	4.58

63	0.73	0.63	6	1	10	0.038	0.23	6.99
64	0.65	0.57	6	1	8	0.010	0.33	4.11
65	2.8	2.45	10	2	12	0.010	0.60	5.87
66	6.6	8.25	15	2	18	0.010	1.01	7.80
67	0.56	0.49	6	1	8	0.010	0.30	3.98
68	0.65	9.31	18	1	10	0.010	0.91	8.31
69	1.27	1.11	8	1	12	0.010	0.41	4.88
70	21.12	18.48	24	2	24	0.010	1.15	9.89
71	0.54	20.07	24	1	10	0.010	1.21	10.07
72	7.03	6.15	15	2	18	0.010	0.79	7.47
73	-	59	24	-	-	0.048	1.51	23.21
74	1.3	1.14	8	-	12	0.026	0.31	7.10
75	0.62	1.68	10	-	10	0.050	0.29	9.85
76	13.04	11.41	15	3	18	0.035	0.79	14.01
77	0.74	0.64	6	-	10	0.041	0.23	7.28
78	1.66	13.5	18	-	12	0.040	0.74	15.41
79	2.11	1.85	8	-	12	0.147	0.25	15.18
80	1.27	2.96	8	-	12	0.186	0.31	18.74
81	1.29	4.08	10	-	12	0.179	0.33	19.94
82	1.84	5.69	10	-	12	0.083	0.51	16.27
83	1.36	6.88	12	-	12	0.053	0.58	14.46
84	0.54	0.47	6	-	10	0.067	0.17	7.97
85	0.68	1.06	6	-	10	0.055	0.29	9.14
86	1.51	9.26	15	-	12	0.019	0.84	10.57
87	10.85	9.5	12	2	24	0.110	0.57	20.59
88	0.51	9.95	15	-	10	0.038	0.71	13.91
89	4.07	13.51	18	2	12	0.010	1.22	8.81

Depending on the pipe location, it was either sized with grated drain inlets or headwalls. Drain piping outlets will discharge into Llagas Creek through outlet structures. A rip rap outlet structure detail is shown on Exhibit 5.

APPENDIX F

Biological Report

Prepared by

H.T. Harvey & Associates

May 1998

H.T. HARVEY & ASSOCIATES
ECOLOGICAL CONSULTANTS

29 May 1998

Mr. Bert Verrips
Nolte and Associates, Inc.
1 N. First Street, Suite 450
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facsimile: 510.547.6677

SUBJECT: Hayes Valley (Lions Gate): reconnaissance-level biotic constraints survey

Dear Mr. Verrips:

We have finished our reconnaissance-level field survey of the project modification areas. Three specific areas were surveyed, including: (1) the newly-proposed location of the clubhouse, (2) creek by-pass channels, and, (3) new location of the stable/corral complex. The purpose of our survey was to determine if these proposed changes to the original project resulted in significant impacts to biotic resources on site. Survey personnel included Dr. Patrick Boursier, plant ecologist. A detailed project description and field review of each location was supplied by Mr. Ron Davis. All of these three sites occur within the project boundaries intensively surveyed by H. T. Harvey & Associates staff in 1994-95 in preparation of our report entitled *Hayes Valley, Biological Resources Report* (30 Nov 95; PN 385-11). Each of the project modification sites are discussed below.

1. Clubhouse Site: The proposed location is within habitat previously identified in our report as non-native annual grassland situated near the confluence of two riparian corridors. It is our understanding that no trees will be removed within this area, the previously-approved riparian setback distance of 75 feet will be maintained, the creek crossing will occur at the same location as that initially proposed for the golf cart path crossing, however, the crossing will be widened somewhat to accommodate two-lane traffic. One two-lane bridge crossing is to be removed. This proposed modification will not result in any additional direct or indirect impacts to biotic resources.
2. Creek By-pass Channel: The by-pass channel occurs within the portion of the project site originally identified as agricultural, situated along Highland Avenue near its intersection with Coolidge Avenue. It is understanding that water from the native channel will be diverted above the 2.3-year flood event, all existing riparian vegetation will remain, water will be placed into a series of on-site retention basins. This proposed modification will not result in any additional direct or indirect impacts to biotic resources.

3. Stable/Corral Complex: The access road and stable/corral complex occurs within a habitat identified in our 1995 report as non-native annual grassland. The access road will utilize a currently-existing, unimproved dirt road. The access road will cross two seasonal drainage channels with existing culvert and/or bridge crossings. These crossings will be upgraded to handle increased traffic and may result in relatively minor impacts to seasonal wetland habitats within one of the drainages (on the order of 10-25 square feet). This proposed modification will not result in any additional direct or indirect impacts to biotic resources.

In summary, the proposed modifications discussed above will not result in significant impacts to existing biological resources, beyond those already identified and addressed in the approved Environmental Impact Report.

If you our your staff have any questions please feel free to contact me or Rick Hopkins.

Sincerely,

Patrick J. Boursier, Ph.D.
Division Head, Botany and Wetlands

APPENDIX G

Archaeological Report

Prepared by

Basin Research Associates

May 1998

29 May, 1998

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San Jose, CA 95113

RE: Review of Previous Cultural Resources Studies
Proposed Location of Club House, Horse Stables and Creek Bypass Channel
Lions Gate/Cordevalle Project, Santa Clara County

Dear Mr. Verrips,

Please let this letter serve as our review of the proposed location changes for the Club House and Horse Stables as well as the addition of a Creek Bypass Channel for the above project.

As you are aware, the project is situated in an area which has undergone a number of archival reviews and archaeological inventories as a result of cultural resource compliance requirements. Four archaeological sites, CA-SCl-76, SCl-77, SCl-305/H and SCl-568, have been recorded within the boundaries of the proposed project although only one prehistoric site, CA-SCl-76, was relocated during the various field programs. This site was also the subject of a presence/absence testing program to determine its horizontal and vertical extent [Fig. 1]. The three other reported sites for the project area, CA-SCl-77, SCl-305/H and SCl-568, did not have any visible surface indicators of a prehistoric occupation at their recorded location nor did auger testing expose the presence of subsurface cultural materials at their reported locations.

A review of the archival material on file at our office for the project indicates that none of the planned changes for the location of the Club House and Horse Stables will affect any known cultural resources. The Creek Bypass Channel is in the immediate and near vicinity of CA-SCl-76.

It is Basin Research Associates' considered opinion that the construction planned for the project can proceed as planned. No further archaeological research appears necessary and monitoring during subsurface construction at the Club House and Horse Stables does not appear warranted. However, archaeological monitoring of the first three to five feet of subsurface trenching for the Creek Bypass Channel is recommended by a professional archaeologist. The frequency and duration of the monitoring should be at the discretion of the archaeologist and dependent on his/her subsurface observations during trenching.

It is also recommended that if any unanticipated prehistoric or significant historic era cultural materials are exposed during construction, operations should stop within 20 feet of the find and a qualified professional archaeologist contacted for evaluation and further recommendations. Potential recommendations could include evaluation, collection, recordation, analysis, etc. of any significant cultural materials followed by a professional report.[1]

If I can provide any additional information or be of further service please don't hesitate to contact me.

Sincerely yours,
BASIN RESEARCH ASSOCIATES, INC.

Colin I. Busby
Principal

CIB/dg

---

1. Significant prehistoric cultural resources are defined as human burials, features or other clusterings of finds made, modified or used by Native American peoples in the past. The prehistoric and protohistoric indicators of prior cultural occupation by Native Americans include artifacts and human bone, as well as soil discoloration, shell, animal bone, sandstone cobbles, ashy areas, and baked or vitrified clays. Prehistoric materials may include:

    a. Human bone - either isolated or intact burials.
    b. Habitation (occupation or ceremonial structures as interpreted from rock rings/features, distinct ground depressions, differences in compaction (e.g., house floors).
    c. Artifacts including chipped stone objects such as projectile points and bifaces; groundstone artifacts such as manos, metates, mortars, pestles, grinding stones, pitted hammerstones; and, shell and bone artifacts including ornaments and beads.
    d. Various features and samples including hearths (fire-cracked rock; baked and vitrified clay), artifact caches, faunal and shellfish remains (which permit dietary reconstruction), distinctive changes in soil stratigraphy indicative of prehistoric activities.
    e. Isolated artifacts

    Historic cultural materials may include finds from the late 19th through early 20th centuries. Objects and features associated with the Historic Period can include.

    a. Structural remains or portions of foundations (bricks, cobbles/boulders, stacked field stone, postholes, etc.).
    b. Trash pits, privies, wells and associated artifacts.
    c. Isolated artifacts or isolated clusters of manufactured artifacts (e.g., glass bottles, metal cans, manufactured wood items, etc.).
    d. Human remains.

    In addition, cultural materials including both artifacts and structures that can be attributed to Hispanic, Asian and other ethnic or racial groups are potentially significant. Such features or clusters of artifacts and samples include remains of structures, trash pits, and privies.

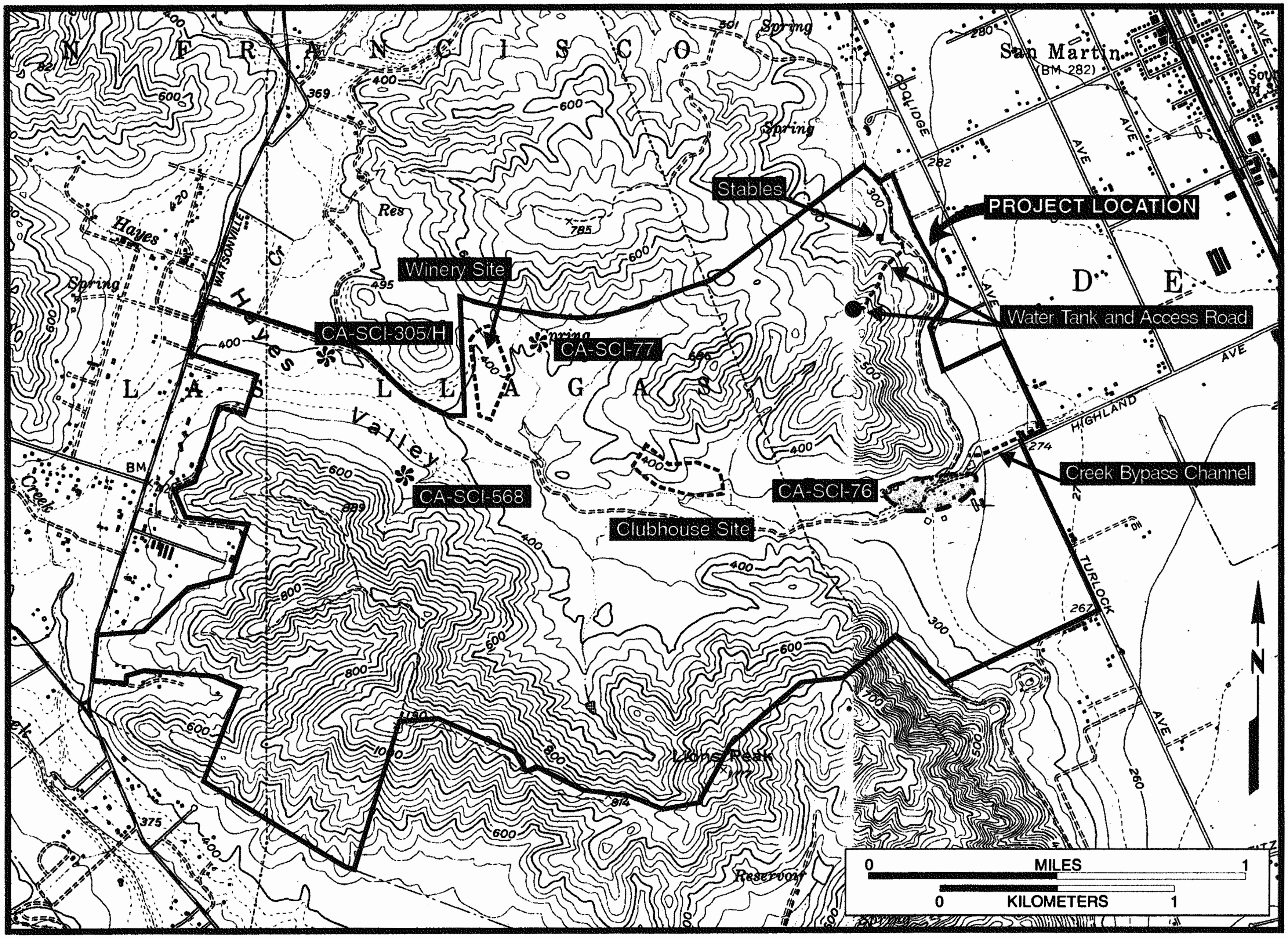


Figure 1: Project Location with Archaeological Sites and Planned Changes (USGS Mt. Madonna, Calif. 1980 and Gilroy, Calif. 1981)

APPENDIX H

Traffic Report

Prepared by

TJKM Transportation Consultants

May 1998

TJKM Transportation Consultants

May 27, 1998

Mr. Bert Verrips
Nolte Associates
1 North First Street, Ste 450
San Jose, CA 95113

Subject: **Traffic Impact due to Incremental Square Footage in Restaurant Space at the Proposed Hayes Valley Country Club in the County of Santa Clara**

Dear Mr. Verrips:

TJKM Transportation Consultants is pleased to present this traffic evaluation based on changes to the development proposal since our February 1996 traffic study report on the proposed Hayes Valley development. The new proposal calls for the restaurant space in the golf club house facility to be roughly 5,800 square feet as opposed to 4,000 square feet as was previously proposed. This letter report presents our evaluation of the impact of that incremental development. In summary, the impact of the additional space is negligible. No change in intersection delay or level of service occurs.

Note that this analysis uses the same trip generation and capacity analysis methodologies as the previous study. This is done to maintain consistency with this study despite minor recent changes in the ITE trip generation rates and the adoption by the county of new capacity analysis software.

Previous Impacts

In our earlier study, the proposed project was not found to have significant impacts at any of five study intersections:

1) Santa Teresa Boulevard/Sunnyside Avenue/Watsonville Road
2) Coolidge Avenue/San Martin Avenue
3) Monterey Road/San Martin Avenue
4) Santa Teresa Boulevard/Highland Avenue
5) Monterey Road/San Martin Avenue

In fact, even in the ultimate scenario which evaluated Existing plus Approved plus Proposed Project Traffic plus Expected Growth, only the p.m. peak conditions at the intersection of Monterey Road/San Martin Avenue fell below LOS B (at LOS C-).

Impact of Incremental Development

In order to determine whether the additional restaurant space, roughly 2,000 square feet, would produce an impact it is only necessary to add the incremental traffic generation and re-evaluate the project impact. Because the most project traffic is routed through the intersection of Monterey Road/San Martin Avenue, and this is the most congested intersection, a determination that there would be no p.m. peak impact at that intersection is a necessary and sufficient condition of determining that there would be no impact at any location.

Using the trip generation assumptions of our previous analysis, the incremental trip generation due to the additional restaurant space would consist of 2 additional trips in the a.m. peak (1 in, 1 out) and 15 additional trips in the p.m. peak (10 in, 5 out). The 15 p.m. trips are of importance here -- 12 p.m. peak trips would be assigned to Monterey Road/San Martin Avenue. Assigning this additional traffic to the intersection and replicating the capacity analysis from the previous study reveals that all measures of delay and level of service are unchanged from the previous study (24 seconds of delay, LOS C-). Detailed calculation sheets from the latest analysis and the previous study are presented in Attachment A.

Conclusion

As has been shown, the impacts of the previous study are not changed given the additional restaurant space, the conclusion of no impact and therefore no mitigation measures also holds.

I hope that this analysis has been helpful. If there are any questions or comments, please feel free to give me a call.

Sincerely,

Michael Carroll
Transportation Engineer

rhm
Attachments
146-026l.1mc

Attachment A

Detailed Calculation Sheets

11-16-95

Previous Proposal

C A P S S I
COMPREHENSIVE ANALYSIS PROGRAM
FOR A SINGLE SIGNALIZED INTERSECTION *

Santa Clara County
EX + AP + PR + EXPECTED GROWTH
SOLUTION USING REQUIRED CYCLE TIME

FLN:3eg_p

3. Monterey/San Martin   P.M Peak Hour   Scenario 1

Movement	EBT	EBL	EBR	SBT	SBL	SBR	WBT	WBL	WBR	NBT	NBL	NBR
Phase 1 - 43 secs	X	X	X	.	.	.	X	X	X	.	.	.
Phase 2 - 5 secs	.	.	.	.	X	.	.	.	.	.	X	.
Phase 3 - 13 secs	.	.	.	X	X	X	.	.	.	.	.	.
Phase 4 - 26 secs	.	.	.	X	.	X	.	.	.	X	.	X
Phase 5 - 0 secs	.	.	.	.	.	.	.	.	.	.	.	.
Phase 6 - 0 secs	.	.	.	.	.	.	.	.	.	.	.	.
Critical Mvmt-**					****		****			****		
Peak 15 Vol -vph	86	17	16	519	222	41	82	175	253	426	12	188
Saturation -vph	1000	Shrd	1800	3600	1700	1800	1300	Shrd	Shrd	3600	1700	Shrd
Lost time -sec	4.00	-	2.00	6.00	4.00	2.00	4.00	-	-	6.00	4.00	-
Relative Sat 'X'	0.23	-	0.02	0.38	0.81	0.05	0.88	-	-	0.74	0.61	-
Effective Gr-sec	39	-	41	33	14	37	39	-	-	20	1	-
Move Time -sec	43	-	43	39	18	39	43	-	-	26	5	-
Min/Ped Time-sec	26	-	26	26	4	26	26	-	-	26	4	-
Prog Factor PAF	1.00	-	1.00	1.00	1.00	1.00	1.00	-	-	1.00	1.00	-
AvDelay/veh -sec	11	-	9	15	38	11	26	-	-	26	60	-
Level of Service	B-	-	B+	B-	D-	B-	D+	-	-	D+	F	-
Av.'Q'/ lane veh	1	-	0	4	5	1	7	-	-	6	0	-
Veh Stopping %	62	-	53	73	97	59	91	-	-	93	100	-
Do Veh Clear ?	YES	-	YES	YES	YES	YES	YES	-	-	YES	YES	-

Whole Intersection - Weighted Av Delay (sec) = 24 Level of Service = C-
Critical Movements - Weighted Av Delay (sec) = 28 Level of Service = D+
'' '' - Intersection Capacity Utilization (ICU) = 0.83

Required Cycle Length is 87 seconds (All Minimum times are satisfied)

* CAPSSI (Release 11) - Based on Delay Methodology Per 1985 Highway Capacity Manual

05-26-98 Revised Proposal

C A P S S I
COMPREHENSIVE ANALYSIS PROGRAM
FOR A SINGLE SIGNALIZED INTERSECTION *

SOLUTION USING PREDETERMINED CYCLE TIMES

FLN:rico

monterey/san martin — A.M Peak Hour — Scenario 1

Movement	EBT	EBL	EBR	SBT	SBL	SBR	WBT	WBL	WBR	NBT	NBL	NBR
Phase 1 - 45 secs	X	X	X	.	.	.	X	X	X	.	.	.
Phase 2 - 5 secs	.	.	.	.	X	.	.	.	.	.	X	.
Phase 3 - 13 secs	.	.	.	X	X	X	.	.	.	.	.	.
Phase 4 - 24 secs	.	.	.	X	.	X	.	.	.	X	.	X
Phase 5 - 0 secs	.	.	.	.	.	.	.	.	.	.	.	.
Phase 6 - 0 secs	.	.	.	.	.	.	.	.	.	.	.	.

	EBT	EBL	EBR	SBT	SBL	SBR	WBT	WBL	WBR	NBT	NBL	NBR
Critical Mvmt-**					****		****			****		
Peak 15 Vol -vph	87	17	16	520	222	41	83	180	253	427	12	191
Saturation -vph	1000	Shrd	1800	3600	1700	1800	1300	Shrd	Shrd	3600	1700	Shrd
Lost time -sec	4.00	-	2.00	6.00	4.00	3.00	4.00	-	-	6.00	4.00	-
Relative Sat 'X'	0.22	-	0.02	0.41	0.81	0.06	0.84	-	-	0.83	0.61	-
Effective Gr-sec	41	-	43	31	14	34	41	-	-	18	1	-
Move Time -sec	45	-	45	37	18	37	45	-	-	24	5	-
Min/Ped Time-sec	20	-	20	20	0	20	20	-	-	20	0	-
Prog Factor PAF	1.00	-	1.00	1.00	1.00	1.00	1.00	-	-	1.00	1.00	-
AvDelay/veh -sec	10	-	9	16	38	13	23	-	-	31	60	-
Level of Service	B-	-	B+	C+	D-	B-	C-	-	-	D	F	-
Av.'Q'/ lane veh	1	-	0	4	5	1	7	-	-	6	0	-
Veh Stopping %	59	-	51	75	97	62	88	-	-	96	100	-
Do Veh Clear ?	YES	-	YES	YES	YES	YES	YES	-	-	YES	YES	-

Whole Intersection - Weighted Av Delay (sec) = 24 Level of Service = C-
Critical Movements - Weighted Av Delay (sec) = 29 Level of Service = D+
" " - Intersection Capacity Utilization (ICU) = 0.83

Predetermined Cycle Length is 87 seconds (Min. times may not be satisfied)

* CAPSSI (Release 11) - Based on Delay Methodology Per 1985 Highway Capacity Manual

APPENDIX I

Noise Report

Prepared by

Illingworth & Rodkin

May 1998

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality

May 29, 1998

RECEIVED
JUN - 1 1998
NOLTE and ASSOCIATES
SAN JOSE

Bert Verrips
Nolte & Associates
1 North First Street, Suite 450
San Jose CA 95113

Subject: Hayes Valley Ranch EIR

Dear Bert:

This letter is in response to the proposed change in the clubhouse location at Hayes Valley Ranch. The clubhouse under the current plan would be moved approximately 600 feet closer to the home located on the ridge to the east of the Hayes Valley. Noise generated at the clubhouse area would be perceived at a level about 2 decibels louder than the location farther from the home. The resulting level would not be noticeably different than generated at the previous location and the resulting noise levels would be within the range predicted at our previous study as noted in our letter dated February 5, 1996.

Sincerely,

Richard R. Illingworth, PE

RRI:lk
(95-012)

85 Bolinas Road, #11 • Fairfax, California 94930 • (415) 459-5507 • FAX (415) 459-6448

ion's Gate Reserve
4039 2nd Add. EIR

LSA | LSA ASSOCIATES, INC.
157 PARK PLACE
PT. RICHMOND, CALIFORNIA 94801
510.236.6810 TEL
510.236.3480 FAX
OTHER OFFICES:
BERKELEY
IRVINE
RIVERSIDE
ROCKLIN

September 23, 2003

Molly Martindale
U.S. Army Corps of Engineers
333 Market Street
San Francisco, CA 94105-2197

Subject: CordeValle Wetland Delineation and Impact Analysis
Corps File No. 22287S

Dear Molly:

Enclosed please find a revised wetland delineation and impact analysis for the CordeValle site in San Martin, Santa Clara County, California.

Wetland Delineation

LSA had initially sent you a delineation report, dated January 15, 1997. Because site conditions have changed substantially with the construction of the project, we are submitting this new wetland delineation report. We request that you verify this determination of Section 404 jurisdictional area. Please let me or Sean Lohmann at LSA know if you would like to conduct a site inspection, need additional copies of the delineation map, etc.

Impact Analysis

CordeValle's original non-reporting Nationwide Permit 26 under the Clean Water Act had a 1-acre ceiling for impacts. The projected impacts were 0.92 acre. LSA found that actual impacts were 0.96 acre. Impacts were calculated using conservative criteria. For instance, the disappearance of Pond 9 was debited against the project, even though the Corps might determine that this loss was not caused by any action of CordeValle. In any case, we believe that the projected and actual impacts are practically the same, and that the mathematical difference of 0.04 acre is within the margin of error of our recording and calculating methods. Therefore, we conclude that CordeValle is in compliance with its nationwide permit, pending review by the Corps.

Mitigation

We have calculated mitigation credits in the form of created and expanded jurisdictional waters of 3.30 acres. This total is of course subject to your review of the admissibility of the various waters cited in our report. CordeValle's total mitigation obligations to the County of Santa Clara and to the California Department of Fish and Game are approximately 3.83 acres. CordeValle will be meeting those responsibilities through the creation of additional mitigation ponds for California tiger salamanders (CTS). LSA will be conducting CTS surveys on the CordeValle property this winter, and will be submitting a mitigation plan for review by the various resource agencies in the spring of 2004. This document will include plans for the construction of the final required mitigation features.

CordeValle will be submitting an application to construct these additional mitigation ponds to the Corps in the summer of 2004. As we had discussed on the telephone on June 27, 2003, the application will be made under Nationwide Permit 27, Stream and Wetland Restoration Activities. CordeValle anticipates completing its mitigation requirements with installation of the permitted features in the fall of 2004.

Please call either Sean Lohmann, the principal author of the report, or myself to arrange a site visit or if you have any questions. We are looking forward to continue to work with you on this project.

Sincerely,

LSA ASSOCIATES, INC.

Roger D. Harris
Principal

Encl.: Determination of Section 4040 Jurisdictional Area and Impacts Analysis, CordeValle

cc: Dave Johnston
Department of Fish and Game
P.O. Box 4169
Santa Cruz, CA 95063

Rob Eastwood
Santa Clara Planning Office
County Government Center, East Wing, 7th Floor
70 West Hedding Street, San Jose, CA 95110-1705

Joe Root, General Manager
CordeValle, One CordeValle Club Drive
San Martin, CA 95046

Sean Lohmann, LSA

DETERMINATION OF SECTION 404 JURISDICTIONAL AREA AND IMPACT ANALYSIS

CORDEVALLE

SANTA CLARA COUNTY

Submitted to:

CordeValle
One CordeValle Club Drive
San Martin, CA 95046

Prepared by:

LSA Associates, Inc.
157 Park Place
Point Richmond, CA 94801
(510) 236-6810

LSA Project No. HVD330

LSA

September 23, 2003

TABLE OF CONTENTS

FIGURES

INTRODUCTION

OBJECTIVE

This report presents the results of a delineation by LSA Associates (LSA) of the extent of U.S. Army Corps of Engineers (Corps) jurisdiction on the CordeValle property in Santa Clara County, California. The site contains an 18-hole golf course, guest lodges, a winery, vineyards, a residential development, and open space. The facilities have all been constructed since 1997, and the residential development is still under construction.

The study area for this delineation includes only the immediate vicinities of the developed portions of the property. Much of the property is dedicated open space that has not been included in the study area for this jurisdictional delineation.

LSA originally delineated the extent of jurisdictional waters of the United States, including wetlands, on the site in 1996; before construction of any of the facilities commenced. Corps personnel visited the site on September 9 and October 10, 1996 to verify LSA's results. The final, Corps-verified delineation report was produced on January 15, 1997.

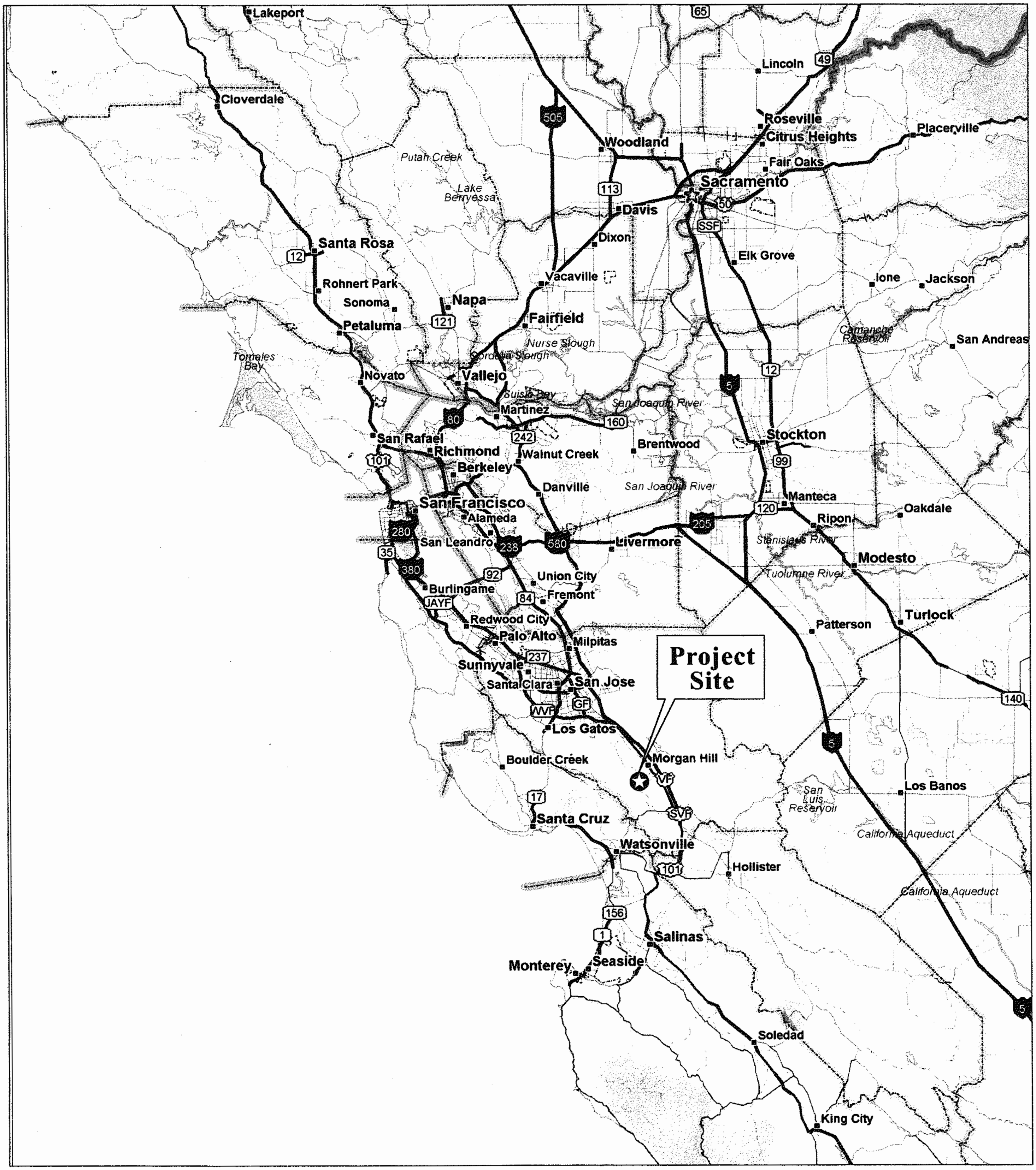
This 2003 wetland delineation updates the 1997 report to document all alteration of Clean Water Act jurisdiction on the property since the 1997 delineation was verified. In areas where LSA did not observe any evidence of natural or man-made alteration of jurisdictional features since 1997, the original, Corps-verified 1997 dimensions and status of those features are reproduced in this report. In developed areas, particularly within the bounds of the golf course, the delineation has been completely revised.

PROJECT DESCRIPTION

Location

The CordeValle site is on Highland Avenue in the unincorporated community of San Martin in southern Santa Clara County, approximately one mile south of the City of Morgan Hill, California. The entire property covers approximately 1,676 acres, and the delineation study area is a subset of this larger property. The site is located in Township 10 South, Range 3 East on the Gilroy and Mt. Madonna 7.5' USGS quadrangles. This former Spanish land grant area has not been divided into sections. Figures 1 and 2 illustrate the regional and USGS locations of the site, respectively.

The property is centered on a broad valley with an east-west alignment. This valley contains the headwaters of the West Branch of Llagas Creek (West Branch), which flows in an easterly direction through the valley and continues eastward into Santa Clara Valley. To the north of the valley is a low ridgeline that separates the valley of the West Branch from Santa Clara Valley and the city of Morgan Hill. To the south the valley is bordered by a steeper ridgeline that includes Lion's Peak, the most prominent hill in the area. The property includes the ridge crest and extends for a short distance down the opposite (southwest) slope of the ridge. On the east, the property continues past the mouth



LSA

FIGURE 1

CordeValle

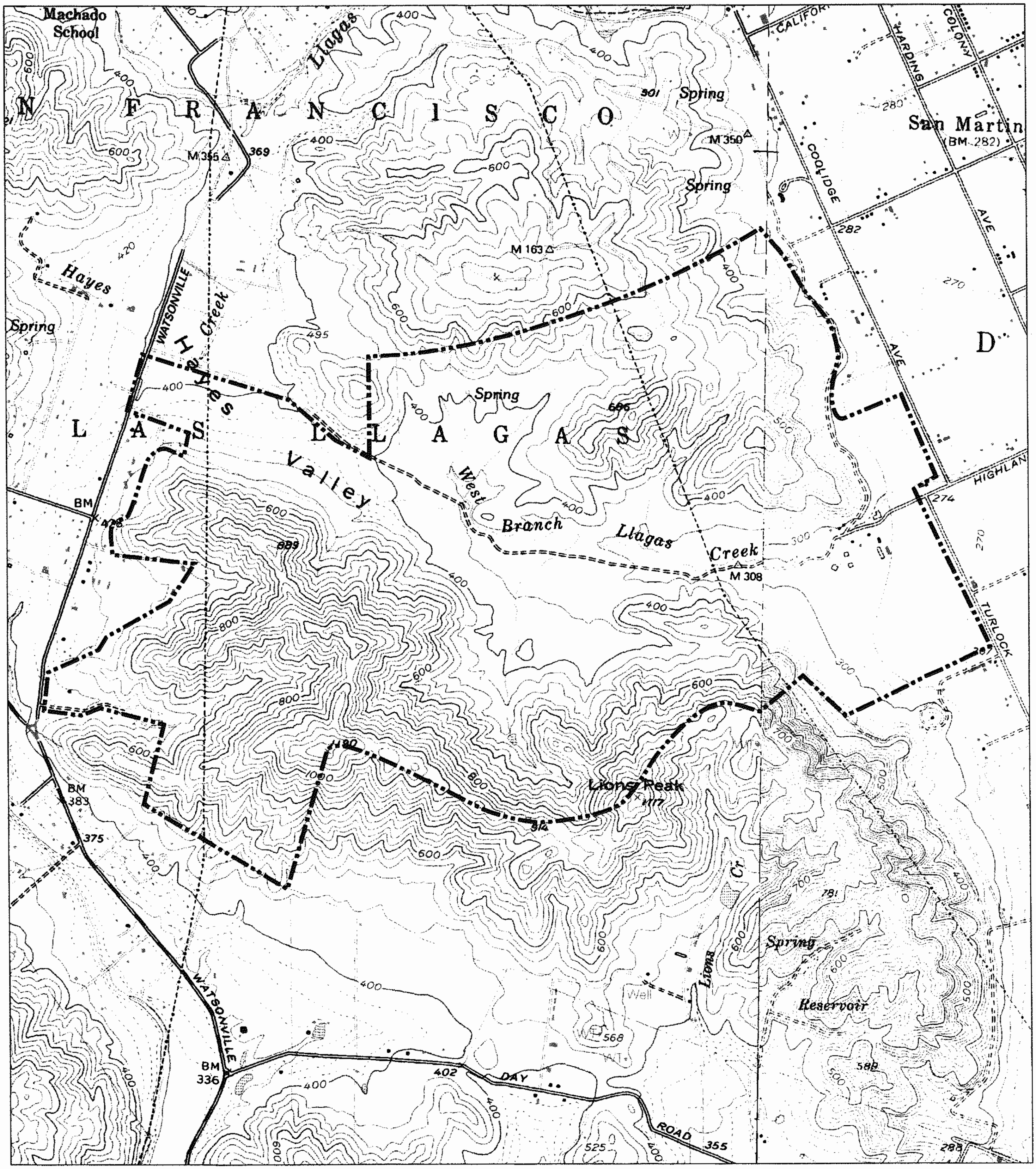
Regional Location

0 24

MILES

SOURCE: ©2002 DeLORME. STREET ATLAS USA®2003.

P:\HVD330\g\RegLoc-CordeValle.cdr (9/15/03)



LSA

FIGURE 2

Project Boundary

CordeValle

Project Site Location

0 2000
FEET

SOURCE: USGS 7.5' QUADS - GILROY, AND MT. MADONNA, CALIF.

P:\HVD330\g\ProjLoc-CordeValle.cdr (9/15/03) of the West Branch valley to include several fields on the floor of Santa Clara Valley proper. The property also extends west into Hayes Valley as far as Watsonville Road.

The CordeValle golf course and country club now occupies the majority of the central valley portion of the site. The winery and vineyards are located in Hayes Valley, while the eastern portion of the property that falls in Santa Clara Valley has been developed with a series of large ornamental ponds and vineyard estate-style residential lots. Primary access to the residential development and country club is from Highland Avenue on the east. The winery and the golf course maintenance complex are accessed from Watsonville Road on the west. There is no accommodation for through-traffic from Highland Avenue to Watsonville Road.

REGULATORY BACKGROUND

The Corps is responsible under Section 404 of the Clean Water Act to regulate the discharge of dredged and fill material into waters of the United States. Waters of the United States and their lateral limits are defined in 33 CFR Part 328.3(a) and include streams that are tributaries to navigable waters and their adjacent wetlands. The lateral limits of jurisdiction for a non-tidal stream are measured at the line of ordinary high water or the limit of adjacent wetlands.

Waters that cannot trace a continuous hydrological connection to a navigable water of the United States are not tributary to waters of the United States. These are termed "isolated wetlands." Isolated wetlands are jurisdictional when their destruction or degradation can affect interstate or foreign commerce (33 CFR Part 328.3(a)). The Corps may or may not take jurisdiction over isolated wetlands depending on circumstances. Isolated waters that are determined to not be subject to CWA regulation may still be subject to state environmental regulation.

SETTING

LAND USE

Much of the West Branch valley floor is now occupied by the 18-hole CordeValle golf course. Associated facilities include a golf club/hotel/pro shop complex, guest lodges, and a shop and maintenance complex. The Hayes Valley portion of the site contains a winery and vineyards. The vineyards are planted in Hayes Valley proper, while the winery has been constructed on a hill that lies between the two valleys and overlooks the golf course.

The remainder of the site, which includes the ridgelines that bound the West Branch valley on the north and south as well as substantial undeveloped portions of Hayes and West Branch Valleys, is open space. The entire site was used as rangeland for cattle prior to development, but livestock have been removed since completion of the golf course. The open space areas still contain the remnants of the network of dirt roads and barbed wire fences that were in place to facilitate grazing of the property. The numerous stock ponds that were present on the site prior to development have been retained, even those that fall within developed areas. The hydrologic functions of some of the latter have been altered however, as discussed later. Several pre-existing ranch structures, corrals, and residences located in a private in-holding near Highland Avenue on the eastern edge of the property also remain.

SURFACE HYDROLOGY

West Branch Llagas Creek

Drainage on the property consists of a network of intermittent and ephemeral streams that flow from the ridges on the perimeter of the central valley into the West Branch of Llagas Creek in the valley bottom. The West Branch flows east through the valley and out into the Santa Clara Valley. The West Branch then proceeds south through a mostly channelized open streambed towards the City of Gilroy, eventually merging with Llagas Creek proper. Llagas Creek is tributary to the Pajaro River.

Within the West Branch valley the golf course now completely surrounds the creekbed. The golf course was designed to avoid direct alteration of the streambed, however, so the streambed is largely intact and unaltered. Exceptions include a number of bridge footings and small bank stabilizations.

The West Branch was historically intermittent, but now has perennial flow within the bounds of the golf course. Dry season flows are a consequence of surface and subsurface runoff from golf course irrigation.

Primary West Branch Tributaries

The West Branch has eight primary tributaries in the study area. Four of these drain from the ridge north of the valley and four originate on the southern ridgeline. These tributary streams flow during winter and spring months for varying periods and are dry the remainder of the year. The tributaries are numbered from 1 to 8 in this report for reference. The labeling of the tributaries and drainages are shown on Figure 3.

Many of the tributary segments that cross the West Branch valley floor were avoided by golf course construction. These tributaries now flow on the perimeter of the landscaped turf, or in some cases flow within unaltered natural corridors between fairways. Other segments have been altered in various ways by golf course construction. These tributary segments were either culverted or incorporated as open channels and swales within the golf course drainage network. Most of the altered tributary segments, and even some of the segments that were avoided, now convey dry-season irrigation runoff. The irrigation runoff has caused proliferation of wetland plant cover in these segments.

The larger fraction of the West Branch tributary segments that were previously mapped on the project site are located in open space on the northern and southern ridge slopes, beyond the limits of the golf course and other construction. These segments are unaltered since 1997.

Other Drainages

In addition to the West Branch of Llagas Creek and its tributaries, two smaller drainages are present on the northeastern corner of the property and one small drainage is present in the southeastern portion of the property. These originate on east-facing slopes above Santa Clara Valley, and flow east into the valley. These drainages are referred to as Drainage A, Drainage B, and Drainage C in this report.

Drainages A and B are within open space, and thus were not substantially altered by construction. Drainage C extends within proposed limit of the residential development, but has not yet been substantially altered. CWA Section 404 and Fish and Game Code Section 1603 authorizations held by CordeValle for filling Drainage C have expired.

VEGETATION

The predominant vegetation types in the open space and undeveloped portions of the study area are non-native annual grassland and oak woodland. The dominant grass species in both of these types are soft chess (*Bromus hordeaceous*)[1] and oats (*Avena* sp.). In the lower portions of the valley and adjacent to most of the unaltered drainageways, the predominant grass species is Italian ryegrass (*Lolium multiflorum*). Mediterranean barley (*Hordeum marinum* ssp. *gussoneanum*) is also common.

Riparian woodland still occurs along most of the West Branch of Llagas Creek. Patches of riparian woodland also occur along limited stretches of some of the larger tributaries. The goal of the golf course design was to retain as much native riparian cover as was practical, but some alteration of the existing cover was necessary to accommodate fairway construction, sightlines, and aesthetics.

1 Plant taxonomy in this report is per the Jepson Manual (Hickman 1993).

Riparian cover has therefore been reduced in some locations. Riparian trees and shrubs have been planted in other locations for both mitigation and aesthetic enhancement purposes.

SOILS

The USDA Natural Resources Conservation Service (NRCS, formerly Soil Conservation Service) mapped nine soil series in the survey area. The following brief descriptions of these soils are adapted from the *Soil Survey of Eastern Santa Clara Area, California* (SCS 1974).

- *Cropley clay* occurs in a very small portion of the western field adjacent to Watsonville Road. Cropley soils develop on fans and terraces and are underlain by alluvium from mixed sources. Soil depth is 60 inches plus, permeability is slow and it is well drained. The surface layers are dark and cracks form when the soil is dry.
- *Garretson gravelly loam* occurs in a single location south of Llagas Creek near the center of the valley. Garretson soils are valley soils that develop on stream benches and along drainageways and are underlain by alluvium from sedimentary rock. Garretson soils range from 40 to 60+ inches in depth and are well drained with moderate permeability.
- *Gilroy clay loam* is the most widespread soil in the study area. It is an upland soil that covers most of the hills and slopes that border the valley on the north and south. The soil is 18 to 36 inches thick over bedrock and is well drained with moderate permeability. Gilroy soils form on basic igneous bedrock in uplands with slopes of 5 to 75 percent.
- *Hillgate silt loam* occurs in a thin strip in the western field. It is an upland soil that occurs on terraces and is underlain by mixed alluvium. Soil depth is 60 inches plus, it is well drained and permeability is very slow.
- *Keefers clay loam* occurs on gentle slopes south of Llagas Creek. It is an intermediate soil between the upland Gilroy and valley bottom Los Robles series. Keefers soils develop on older alluvial fans and are underlain by alluvium derived from basic igneous rock. The soil typically has a depth of 60 inches plus, is well drained, and has slow permeability.
- *Los Robles clay loam* occurs in the valley bottom adjacent to Llagas Creek and extends up the larger tributary drainages. It is a valley bottom soil occurring on alluvial fans and underlain by stratified alluvium derived from basic igneous rock. It is approximately 58 inches deep, well drained, and has moderately slow permeability.
- *Maxwell clay* occurs adjacent to the upper reaches of Llagas creek. It develops on alluvial fans and is underlain by serpentine alluvium. Soil depth is 60 inches plus, it is moderately well drained and permeability is slow. The surface layers are very dark and subject to deep cracking when dry.
- *Montara rocky clay loam* occurs on upland slopes along the northern border of the study area. Montara is an upland soil underlain by serpentine bedrock. The soil is 10 to 16 inches deep, excessively drained and has moderately slow permeability.
- *Vallecitos rocky loam* occurs on the slopes surrounding the upper reaches of Llagas creek. It is an upland soil 13 to 30 inches deep underlain by sedimentary and metasedimentary bedrock. It is well drained with slow permeability.

None of these soils is listed by the NRCS on their hydric soil list for Santa Clara County. Hydrophytic vegetation or other evidence of potential hydric conditions were primarily observed in valley soils (Los Robles, Maxwell, Keefers, Garretson, Cropley, Hillgate). No potential wetland characteristics were observed within the Gilroy, Montara or Vallecitos soil units on the study area, so no wetland investigations were carried out in these units. These soils primarily occur on the ridges and hilltops surrounding the central valley.

METHODS

HIGH WATER MARK CRITERIA

Corps jurisdiction within watercourses and waterbodies extends to the upper limit of the ordinary high water mark (OHWM). The OHWM is "that line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas." (33 CFR Part 328.3[e]). The OHWM is therefore determined by locating evidence of water flow sufficient to cause shelving, removal of terrestrial vegetation, or to establish a line on the bank. Indicators included the presence of flowing water, scour, silt deposits or debris deposits.

WETLAND CRITERIA

Field investigations of potential wetlands occurring on the project site were conducted using the routine determination method given in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987). This methodology entails examination of specific sample sites within suspected wetlands for hydrophytic vegetation, hydric soils, and wetland hydrology. By the federal definition, all three of these parameters must be present for an area to be considered a wetland.

Hydrophytic plant species are listed by the U.S. Fish and Wildlife Service in the *National List of Plant Species that Occur in Wetlands* (Reed 1988). The *National List* identifies 5 categories of plant species according to their frequency of occurrence in wetlands. These categories are:

- *Obligate wetland plants* (OBL), plants that occur almost always in wetlands.
- *Facultative wetland plants* (FACW), plants that usually occur in wetlands.
- *Facultative plants* (FAC), plants that are equally likely to occur in wetlands or non-wetlands.
- *Facultative upland plants* (FACU), plants that usually occur in uplands.
- *Obligate upland plants* (UPL), plants that occur almost always in non-wetlands.

An area is considered to have hydrophytic vegetation when more than 50 percent of the dominant species in each stratum (tree, shrub, and herb) are in the obligate wetland, facultative wetland, or facultative categories.

Hydric soils are defined by the criteria set forth by the National Technical Committee for Hydric Soils (NTCHS). These criteria are given in the Wetlands Delineation Manual and are based on depth and duration of soil saturation. Hydric soils are commonly identified in the field by using indirect indicators. The most useful of these is soil color, which is strongly influenced by the frequency and duration of soil saturation. Hydric soils tend to have dark (low chroma) colors which are often accompanied by reddish mottles (iron mottles) or grey colors (gleying). These colors are all caused by anaerobic, reduced soil conditions that are brought about by prolonged soil saturation.

Under natural conditions, development of hydrophytic vegetation and hydric soils are dependent on a third characteristic, wetland hydrology. The wetland hydrology criterion is met if the area experiences inundation or soil saturation to the surface for 10 to 15 days during the growing season in an average rainfall year. This is the most difficult criterion to measure in the field due to seasonal and annual variations in water availability. Some of the indicators that are commonly used to identify wetland hydrology include recent sediment deposits, surface scour, and oxidized root channels (rhizospheres) caused by prolonged anaerobic conditions.

SURVEY METHODS

LSA surveyed the site on July 22-24, and August 26, 2003. All jurisdictional features are depicted on Figure 3, attached. Figure 3 is digitally reproduced from an aerial photograph of the site that was taken on August 12, 2003. The photograph was commissioned by CordeValle for the purpose of this delineation and other biological studies.

The photograph has been rectified to reduce photographic distortion. Rectification is based on known landmark locations and distances represented on standard USGS mapping of the project site.

Streamcourse Mapping

Streams were searched along their entire lengths for evidence of the ordinary high water. Widths of waters of the United States were measured at the ordinary high water mark. Streams were separated into segments based on changes in width. The average width of each segment was determined by measuring the width of the stream at several representative points along the segment. Areas of watercourses were calculated by multiplying field-measured width by the length of the stream segment as determined in the field and noted on the aerial photograph.

Each stream segment was assigned a number for reference. Segments were given two-part numbers, reflecting tributary ordination (first-order, second-order, etc.) and an identifying number. For example, stream segment 2-3 is the third segment of second order in the study area. Segment designations for segments occurring in drainages A, B, and C are preceded by the appropriate letter (*e.g.*, A-1-1, B-1-1, C-1-1). All mapped stream segments are listed with their lengths and average widths in Table A of Appendix 1. The location of the segments is shown on Figure 3.

Stream segments that appeared to be unchanged since the original, Corps-verified delineation mapping in 1997 have not been revised or altered in this report. Most stream segments falling outside of construction limits are unchanged since 1997.

Wetlands

Potential wetlands were identified by visual observation of low-lying areas, hydrophytic vegetation, and/or surface indicators of wetland hydrology. Sample points were established within these potential wetlands to determine if federal wetland criteria were indeed met. Vegetation was cataloged, hydrological indicators were searched for, and the soil was sampled at each point. In all, 16 sample sites were established. The field data sheets for these sites are included as Appendix 2 of this report. Their locations are shown on Figure 3.

Wetland boundaries, as well as boundaries of seeps and ponds, were primarily mapped by identifying and tracing the limits of wetland vegetation on the aerial photograph. All features were also assessed and measured directly in the field in order to confirm the accuracy of the aerial photograph interpretation.

RESULTS

This chapter discusses our findings concerning the extent of each jurisdictional type in the study area. Figure 3 depicts the locations of specific features, and their dimensions are listed in Appendix 1. The total extent of Clean Water Act jurisdiction within the study area is 14.38 acres. Tables F and G from Appendix 1 are reproduced here to provide a breakdown of jurisdictional waters by type:

TOTAL WATERS OF THE U.S.

Type	Total Area (sq. ft.)	Total Area (ac.)	Wetland Subtotal (sq. ft.)	Wetland Subtotal (ac.)
Streams	191,059	4.39	161,764	3.71
Seeps	19,780	0.45	19,780	0.45
Stock Ponds	66,825	1.53	65,325	1.50
Golf Course Ponds	176,810	4.06	0	0.00
Wetlands	171,390	3.93	171,390	3.93
Drainage Ditches	550	0.01	350	0.01
Total Waters of the U.S.	**626,414**	**14.38**	**418,609**	**9.61**

NON JURISDICTIONAL WATERS

Feature	Area
Detention Basin	41,700
Ornamental Ponds	1,054,690
TOTAL (sq. ft.)	**1,096,390**
(acres)	**25.17**

The "wetland" totals in the uppermost table distinguish all features that LSA determined to have wetland plant cover and to otherwise meet federal wetland criteria. The remaining acreage consists of jurisdictional areas that lack wetland plant cover, and includes scoured stream segments, open water waterbodies, etc.

STREAMS

Average stream channel width ranges from 1-2 feet in the upper reaches of the tributary drainages to 8-10 feet on West Branch. Each of the stream segments exhibit evidence of annual flow in the form of scour caused by runoff during and after winter storms. In most cases the scour is obvious, with bare soil and vertical banks caused by undercutting. In other cases, evidence of scour is limited to the presence of a sharp angle or nickpoint between the channel bottom and the banks.

Many of the tributaries have been altered as they pass through the golf course. New or substantially altered stream segments are designated with an "N" on Figure 3 and in Appendix 1. These segments are often subject to year-round flow due to adjacent irrigation, and support dense wetland plant cover. All of the other tributary segments are seasonally intermittent.

A few tributary segments widen into meadows or wet swales as the tributary passes through level terrain. These segments are broad and are defined more by the extent of wetland characteristics than by physical evidence of ordinary high water. The best examples of wet swales are tributary segments 1-18 and 3-3. Several of the newly created golf course segments fit this description as well (*e.g.*, N-19, N-21 through N-24).

The West Branch has not been physically altered, except by installation of stone bridge footings and bank stabilization structures. The hydrology and plant cover has been affected by golf course runoff, however. Runoff from irrigation maintains continuous saturation and ponding within the streambed through the dry season. This moisture supports proliferation of algae, aquatic vegetation, and terrestrial hydrophytic plant species. Riparian shrubs and trees, especially blackberry (*Rubus concolor*) and willows, are expanding vigorously on the creek banks.

The dry season flow and resulting prolific riparian growth does not extend far beyond the edge of the golf course. The irrigation runoff rapidly percolates into the streambed, so that the streambed is quite dry at a distance of less than 100 feet from the edge of the golf course. This transition from moist, densely vegetated streambed to bare, dry streambed occurred on Segment 1-3, just upstream of the CordeValle Club Road bridge. The exact dry season transition point probably varies depending on the intensity of irrigation.

Dimensions of specific stream channel segments are listed in Table A of Appendix 1.

SEEPS

Seeps qualify as wetlands based on readily observable saturation of the soil to the surface for an extended period of time. Individual seeps can vary considerably in size over time based on fluctuations in rainfall, and they may vanish completely during extended periods of low rainfall. Alternately, new seeps may develop during abnormally rainy periods. Seeps are often isolated from other waters of the United States and thus may not be subject to Corps jurisdiction. The subject of isolation is addressed in more detail at the end of this results discussion.

Nine seeps were mapped in the study area in 1997, and six additional seeps were observed in 2003. Discussions of specific seeps follow:

- Seeps 1, 4, 5, 6, and 7 are unchanged since 1997. Most of these are located in open space.
- Seeps 2 and 8 have dried out since 1997. Both of these seeps are located adjacent to the golf course, but there is no apparent mechanism by which golf course construction may have altered the groundwater sources for these seeps. The drying of these seeps is therefore determined to be a natural, climate and subsurface hydrology-related occurrence.
- Seep 3 was located at the edge of the golf course (Hole 17) and has been partially filled. The remaining, unfilled portion of the seep is no longer moist. LSA is uncertain as to the cause of the apparent drying of the seep.
- Seep 9 was eliminated by golf course construction.
- Seeps 10, 11, 12, and 13 have developed in Hayes Valley since 1997. These seeps could have conceivably developed as a result of irrigation of a new vineyard that was planted immediately upslope from the seep locations, but this explanation is unlikely. The more likely explanation is that these seeps naturally develop and dry out on a periodic basis. An old, decrepit spring box is present within the bounds of one of these seeps (Seep 10), indicating that ranchers were aware of shallow groundwater at that location long before vineyard construction. Also, the vineyard practices conservative irrigation, so that runoff and percolation are minimized.
- Seep 14 has developed immediately adjacent to the golf course and adjacent to Seep 2. The location of the seep, on level ground immediately adjacent to the golf course, indicates that the new seep is likely caused by subsurface irrigation runoff.
- Seep 15 has developed adjacent to Stream Segment N-22 (on Tributary 6), near Hole 6. The source of this new seep is not apparent. There is no irrigation upslope from the seep location, so the seep is most likely not related to golf course runoff.

Acreages of specific seeps are presented in Table B of Appendix 1.

STOCKPONDS

Stock ponds constructed on a jurisdictional watercourse are also considered waters of the United States. Ranchers constructed ten stock ponds in the study area in the years prior to golf course construction. The limit of jurisdiction for stock ponds is the high water mark or, if present, the outer limit of wetland characteristics. The high water mark was obvious at all of the stock ponds due to drifted debris, lack of vegetation, and scour.

Only two of the stock ponds, Ponds 2 and 9, have been altered since 1997. Pond 2 was reduced in size by about 1,300 square feet due to alteration of its berm, and Pond 9 was removed. Pond 9 was located in a corner of one of the fields on the eastern portion of the property, in Santa Clara Valley. Only a small fraction of Pond 9 originally occurred on CordeValle property in 1997. The majority of the pond was located on a neighboring property, but the pond extended for a short distance onto CordeValle property. The neighboring property was developed between 1997 and 2000, resulting in elimination of the majority of the pond and de-watering of the CordeValle portion. CordeValle subsequently constructed a vineyard adjacent to the pond location and the location was tilled, along with the rest of the surrounding field. LSA did not observe distinct wetland characteristics in this location in 2003.

All other stock ponds on the CordeValle site appear similar to their 1997 condition and are presumed to have the same dimensions.

The acreages of stockponds on the property are listed in Table C of Appendix 1.

OTHER PONDS

A number of other ponds are present in the study area, all of which are man-made and have been constructed as components of the project. The acreages of these ponds are listed in Table D of Appendix 1 if they are likely to be jurisdictional; they are otherwise listed in Table G of Appendix 1.

Irrigation Pond

This large pond was constructed on the edge of the golf course and serves as a reservoir for irrigation water. The water is pumped from an underground aquifer and stored in this pond until it is needed for irrigation. The irrigation pond was constructed over a segment of Tributary 5, which now drains into the pond. Overflow from the irrigation pond, which only takes place during the rainy season, passes through two rip-rapped spillways and wetland NW4 before draining into wetland NW5. The irrigation pond remains full year-round and does not support significant vegetation. The Corps is likely to assert jurisdiction over this pond because it is continuous with Tributary 5, a pre-existing water of the United States.

Golf Course Ponds

These are three ornamental ponds constructed on the golf course. Two are located between Holes 18 and 10 (Hole 18 Ponds), and the third is located adjacent to Hole 8 (Hole 8 Pond). Golf course staff try to keep water levels constant in these ponds and try to keep them relatively free of vegetation. The Corps is also likely to consider these ponds to be jurisdictional as Tributary 1 flows through the Hole 18 Ponds and Tributary 8 flows through the Hole 8 Pond.

Ornamental Ponds

A series of large ponds has been excavated among the vineyard estates on the eastern portion of the project site. These ponds were constructed as aesthetic amenities and also provide for flood detention. As with the golf course ponds, maintenance staff maintain water levels at constant elevations. Few natural riparian or wetland plants have yet established in these ponds, but some wetland plants have been planted. The Corps is not likely to find that these ponds are subject to Clean Water Act jurisdiction because they are artificial and constructed in former uplands.

Detention Basin

A large flood detention basin has been constructed at the easternmost end of the property, adjacent to Santa Theresa Road. There is no convincing ordinary high water mark in this basin, and two sample points located in the lowermost portions of the basin do not meet wetland criteria. The basin is not a water of the United States.

SEASONAL WETLANDS

Hayes Valley contained several natural seasonal wetlands in 1997, but no other seasonal wetlands were present elsewhere in the study area. Since then, several new wetlands have been intentionally created or have developed incidentally in the vicinity of the golf course. The acreages of specific wetlands are presented in Table E of Appendix 1.

Hayes Valley Wetlands

A number of pre-existing, naturally-developed jurisdictional wetlands occur along the northern boundary of the westernmost field on the CordeValle property. The wetlands extend in a string from Watsonville Road eastward to the crest of a saddle that divides the West Branch Valley from Hayes Valley. The wetlands occur in four units which have been labeled W1 through W4 on Figure 3.

Wetland W1 includes a swale that drains the upper part of Hayes Valley, and a broader area that the swale flows to. The swale begins at the crest that separates Hayes Valley from the West Branch valley and runs for 800 feet down a shallow slope along the northern boundary of the study area. This wetland was not very well expressed in 1997, and has even fewer wetland characteristics at present. Sample Point 10, located in the approximate center of W1, does not meet wetland criteria. Based on the lack of wetland characteristics there and elsewhere within W1, LSA has reduced the size of the wetland. The new extent of W1 is based on dominance of Mediterranean barley, and exclusion of most non-wetland grass and herbaceous species within the mapped wetland area.

Unlike Wetland W1, Wetlands W2, W3 and W4 have not changed substantially since 1997. The soils in these wetlands are mottled, and the most numerous plant species are Mediterranean barley and Italian ryegrass. Subdominant plant species include rabbit's-foot grass (*Polypogon monspeliensis*), hyssop loosestrife (*Lythrum hyssopifolium*), doveweed (*Eremocarpus setigerous*), and spikerush (*Eleocharis* sp.). The ground surface at the centers of these wetlands is often partially bare due to the suppression of vegetation by ponded water. This is a convincing indicator of wetland hydrology. Wetland boundaries were determined by a sharp transition from the wetland plant community described above to a mixed community of Italian ryegrass and upland grasses and forbs. This transition shows clearly on the 2003 aerial photograph, which was used to more accurately map the extent of these wetlands. The wetlands are otherwise unchanged since 1997.

New Wetlands

In addition to the various artificial ponds previously discussed, the project has involved intentional and incidental creation of numerous wetlands. These wetlands are located both within the bounds of the project and in open space areas, and have a variety of origins and characteristics. None of these wetlands were present when the 1997 wetland report was completed. Discussions of specific wetlands follow.

Wetlands NW1-NW4. These wetlands were intentionally constructed within the bounds of the golf course. They are intended to provide aesthetic enhancement for the course, to provide water quality and habitat function, and to provide partial compensation for impacts to pre-existing jurisdictional waters.

Wetlands NW1 and NW2 were constructed in series with a re-constructed length of Tributary 1. Wetland NW1 was constructed as a margin to the westernmost Hole 18 Golf Course Pond. Wetland NW2 was constructed upstream from Wetland NW1, in a deep basin between Holes 10 and 18. Wetland NW3 is in a swale between Holes 15 and 17, in the approximate former location of a segment of Tributary 1. Wetland NW4 is a small basin that was constructed in series with the Irrigation Pond spillway.

Wetlands W1-W3 function as perennial wetlands due to year-round inputs of golf course irrigation runoff. Wetland W4 is dependent on overflow from the Irrigation Pond for summer moisture. Since summer overflow is rare, Wetland W4 functions more as a seasonal wetland and dries in the summer. All four wetlands are located in basins and would be expected to function as seasonal wetlands in the absence of golf course irrigation.

The wetlands are all dominated centrally by large stands of young willow, which cover the majority of the mapped wetland areas. The willow stands are fringed by hydrophytic, seasonal wetland plant cover. Common species in the fringe areas include bristly ox-tongue (*Picris echioides*), rabbit's-foot grass, willow-herb (*epilobium* sp.), and curlydock.(*Rumex crispus*).

Wetland NW5. Wetland NW5, also referred to as the Pond 7 Expansion, was also created intentionally as compensation for jurisdictional impacts associated with the project. NW5 is an excavated expansion of Pond 7, which is a large, perennially-inundated stock pond in the center of the project area. The golf course was constructed around the pond, leaving room for the pond, the pond expansion, and upland open space buffer areas.

Pond 7 itself includes both an expanse of open water and extensive adjacent wetlands dominated by rush (*Scirpus* sp.) cattail (*Typha* sp.) and other emergent wetland species. The wetland expansion is perennially moist, like Pond 7, but does not have any open water. The vegetation is more ruderal and tends more toward herbaceous seasonal wetland cover. Curlydock, nut-sedge (*Cyperus eragrostis*), hyssop, and iris-leaved rush (*Juncus xiphioides*) are common dominants.

Wetland NW6. This small wetland is similar to Wetlands NW1-4 in that it has developed within the golf course (between Holes 6 and 7). The wetland is dominated by cattail rather than willow. The most significant difference between NW6 and other wetlands on the golf course is that NW6 is probably entirely dependent on irrigation runoff. The wetland is not located within a basin, and is not connected in any way to a natural watercourse or watershed. The water feeding the wetland originates from a golf course drainage outfall that carries runoff from Hole 7.

Wetland NW7. This wetland is actually a cluster of small seasonal wetlands within a larger retention basin. These wetlands are collectively referred to as the "Retention Basin Wetlands." They have developed in the lowest parts of the retention basin, and are seasonal. The retention basin is designed to receive natural flows from Tributary 3 as well as irrigation runoff from surrounding golf holes. These flows were intended to maintain wetland characteristics throughout the retention basin, but the volume of runoff that reaches the basin is insufficient to do so. Irrigation runoff does not reach the basin at all, and winter flow from Tributary 3 is only sufficient to maintain seasonal wetlands in the lowest portions of the basin.

The wetlands within the basin are either bare due to ponding, or are dominated by wetland grasses such as rabbit's-foot grass, Mediterranean barley, and swamp timothy (*Crypsis schoenoides*).

Wetland NW8. This small basin has been excavated since 1997. The basin is dominated by rabbit's-foot grass and other hydrophytic seasonal wetland plant species. The basin also features an indistinct high water mark consisting of matted organic debris and soil discoloration. The high water mark and the distinct limit of the excavation define the boundaries of Clean Water Act jurisdiction for this wetland.

Mitigation Pond 3

This wetland was constructed by CordeValle as compensation for proposed impacts to Corps jurisdiction associated with project construction. The wetland was constructed by creating 6-12 inch-deep basin within a low-lying area in Hayes Valley. The intention was to emulate the condition and function of Wetlands W1-W4. The mitigation pond is apparently successful as it exhibits all the characteristics of these nearby wetlands (as documented at Sample Point 8).

Culvert Bypass Channel

In addition to its primary function of conveying flood flows, this feature was intended to provide as much as an acre of compensatory wetland acreage. LSA did not observe any wetland characteristics or OHWM within the channel area. We therefore did not map the bypass channel as a potentially jurisdictional feature. Jurisdictional characteristics may develop in the channel over time as more flood events occur.

ISOLATION

Wetlands, watercourses and waterbodies that cannot trace a continuous surface hydrological connection to a navigable water of the United States are isolated. Isolated features are not subject to Clean Water Act or Corps regulation, except under certain special circumstances. The Corps is still developing guidance on what constitutes a hydrologic connection, but interim Corps policy is that any direct or indirect evidence of overland flow between two waters may constitute a connection. Man-made drainage facilities, such as ditches, swales, gutters and culverts, may also serve as hydrological connections.

Due to the lack of determinant guidance on isolation, it is difficult to draw meaningful conclusions prior to consultation with Corps staff. We have therefore not attempted to distinguish isolated features in the mapping or in Appendix 1. Presented below is a list of features that LSA believes are potentially isolated and not subject to CWA jurisdiction.

Streams

Nearly all of the streams on the site are directly or indirectly tributary to the West Branch of Llagas Creek. The exception is Drainage C, which disperses into unconcentrated overland flow soon after emerging from a ravine.

Seeps

Most of the seeps on the site occur adjacent to stream channels and are thus not isolated. Seeps 10, 11, 12, and 13 have developed in the middle of an open field and lack any clear evidence of overland connection to other waters. These seeps may be isolated.

Stockponds

Stockponds are usually constructed by damming jurisdictional streams, and are thus directly connected to other jurisdictional waters. Pond 10, however, is constructed in a non-jurisdictional natural swale. Whether the swale constitutes a hydrologic connection is a matter of Corps discretion.

Other Ponds

All of the constructed ponds are connected via ditch or culvert to jurisdictional stream channels. None are isolated.

Wetlands

All of the Hayes Valley wetlands (including W1-W4, as well as Mitigation Pond 3 and NW8) are potentially isolated. There is a discontinuous series of ruts and swales that pass between and adjacent to the wetlands. These features indicate a general pattern of flow in a westerly direction, toward roadside ditches on Watsonville Road. The ditches eventually connect to streams that intersect the road. Both the ruts and the Watsonville Road ditches are separated by breaks where there is no evidence of flow. The Corps may consider these connections to be too discontinuous and tenuous to establish that the Hayes Valley wetlands are hydrologically connected to navigable waters of the United States.

All other wetlands are in and around the golf course, and are connected to the West Branch via streams, wet swales, and culverts.

IMPACT ANALYSIS

In addition to completing an assessment of the present extent of Clean Water Act jurisdiction in the CordeValle study area, LSA has also completed an assessment of the extent of direct and indirect impacts to jurisdictional waters caused by CordeValle project construction. This assessment also includes a listing of new wetlands present in the study area that may serve as compensatory mitigation for impacts.

This assessment does not attempt to define CordeValle's mitigation requirements, nor does it intend to determine to what extent those requirements have been met. The information is only intended to present the current extent of Clean Water Act impacts and new jurisdiction on the site.

The main body of the analysis consists of the tables in Appendix 3. These tables are a listing of all the potential jurisdictional features on the site, presented in the same order and manner as in Appendix 1. The data presented in the tables are quite different, however. A column-by-column description of the data presented in these tables follows.

DESCRIPTION OF DATA CATEGORIES

Column 1: Feature Designation. The features discussed in Appendix 3 include all extant features (*i.e.,* all features listed in Appendix 1), plus any other features that were present in 1997 that are not present (or no longer have jurisdictional characteristics) in 2003. The tables also include entries for stream segments that have been altered by culverting or bridge construction.

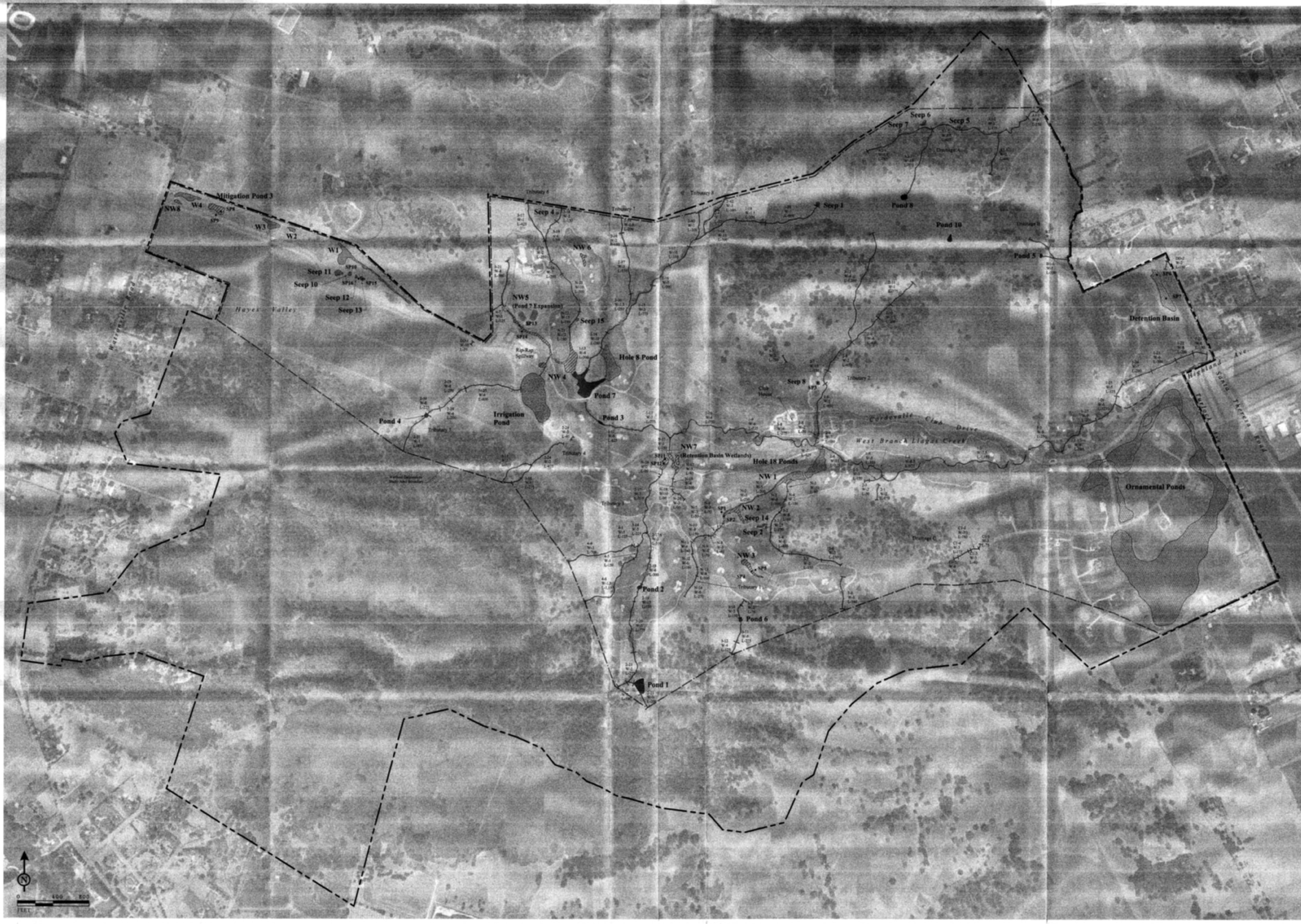
Column 2: 1997 Area. The numbers in this column represent the jurisdictional acreage of the various features in 1997. These numbers are derived directly from the Corps-verified 1997 wetland delineation. A dash or 0 in this column signifies that the feature in question was not present in 1997.

Column 3: 2003 Area. The numbers in this column represent the potential jurisdictional acreage of the various features in 2003. These numbers are derived directly from Appendix 1. These results are subject to confirmation by Corps personnel, and should be considered preliminary until then. A 0 in this column signifies a jurisdictional feature that has been eliminated since 1997, either by project construction or by unrelated processes. A dash indicates features that have no inherent jurisdictional area, such as bridge footings.

Column 4: Difference. This column represents the difference in acreage, if any, between the 1997 and 2003 wetland delineations. The difference may be positive or negative.

Column 5: Comment. In the event that there is a difference between the 1997 and 2003 acreage, this column presents a brief description of the cause of the change.

Column 6: Impacts. This column presents LSA's estimate of the extent of *project-related* impacts to the feature in question. In cases where pre-existing jurisdictional features have been determined to



LSA

JURISDICTIONAL WATERS

STREAM SEGMENT
W-1' SEGMENT WIDTH
L-100' SEGMENT LENGTH
NW NEW WETLANDS
W NATURAL WETLANDS
STOCK POND
SEEPS
GOLF COURSE POND
CULVERT

NON-JURISDICTIONAL FEATURES

NON-JURISDICTIONAL WATER BODIES
CULVERT BYPASS CHANNEL

OTHER FEATURES

PROPERTY BOUNDARY
WETLAND DELINEATION STUDY AREA BOUNDARY
• SP3 SAMPLE POINT
BRIDGES

FIGURE 3

CordeValle

Waters of the United States

PHOTOGRAPHIC BASE TAKEN AUGUST 12, 2003

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be smaller than in 1997 due to non-project-related causes (including revised mapping and reductions caused by natural processes), a "0" is entered into this column.

Impacts may include complete filling of the feature so that it is no longer present or no longer has wetland characteristics, or may involve a discharge of fill that does not eliminate jurisdiction. This latter circumstance usually applies to culverts and bridge footings, and explains why impact values may be shown for features that have not suffered any reduction of jurisdictional acreage.

In the case of culverts, the impact value is derived by multiplying the length of the culverted stream segment by the pre-existing width of the segment. The width of the actual culvert is not considered in determining the extent of impact.

Column 7: Mitigation. This column presents the extent of *project-related* increases in the extent of wetlands in the study area. Non-project-related increases in jurisdictional acreage are not counted in this column. There are also certain project-related increases in jurisdictional acreage that LSA has determined are unlikely to be considered as mitigation by regulatory agencies. These features meet jurisdictional criteria, but have reduced wetland function or value. Examples of the latter include golf course ponds and new culverts. Where LSA has made a determination that the jurisdictional increase is not project-related, or has little mitigation value, a "0" has been entered in this column.

Italics. All features that have changed in some form between the 1997 and 2003 delineations are printed in italics in Appendix 3. Non-italicized features are essentially unchanged.

SUMMARY OF ANALYSIS

Table F from Appendix 3 presents the project impact and mitigation totals, and is reproduced below.

IMPACTS TO WATERS OF THE U.S. - PROJECT TOTALS

Type	1997 Area	2003 Area	Impacts	Mitigation Credit
Streams	193,708	191,059	32,296	31,100
Seeps	16,625	19,780	6,400	0
Stock Ponds	60,205	66,825	3,100	6,745
Golf Course Ponds	0	176,810	0	0
Wetlands	175,546	171,390	0	106,050
Drainage Ditch	0	550	0	0
Total (sq. ft.)	**446,084**	**626,414**	**41,796**	**143,895**
Total (acres)	**10.24**	**14.38**	**0.96**	**3.30**

Impacts

As illustrated in Appendix 3, Table F, project impacts largely consist of discharge of fill in streams. The stream segments that were impacted were generally the lower reaches of the tributaries, particularly Tributaries 1 and 3. The West Branch itself was successfully avoided, except for a few bridge footings. Other primary impacts include reduction of Pond 2 and elimination of Seeps 3 and 9. The elimination of Pond 9 is also counted as a project-related impact, even though the primary reason for the loss of this pond acreage was apparently development on an adjacent property.

The total impact value of 0.96 acres is approximately consistent with the impact total of 0.92 that was projected in the project's permit application documents. The impacts are also approximately consistent with the project's goal of avoiding impacts to West Branch and the majority of ponds, seeps and wetlands.

Mitigation

The mitigation totals in Table F largely result from implementation of several measures proposed in project mitigation plans. Not all of the proposed mitigation in these plans was implemented. The remaining mitigation acreage is a combination of intentional and unintentional wetland and watercourse creation that was not included in mitigation plans. This non-specific approach to mitigation is not entirely inconsistent with the project's permit requirements. The various mitigation plans that were prepared were intended to provide mitigation for a variety of specific impacts; no comprehensive plan was ever required or produced.

Mitigation plan- and permit-specified mitigation measures account for most of the new jurisdictional acreage on the site. Measures that were implemented include Mitigation Pond 3, re-creation of impacted tributaries within the golf course (includes all segments designated "N" in Appendix 3), Pond 7 Expansion (referred to as NW5 in Appendix 3), and creation of the Retention Basin Wetlands (referred to as NW7 in Appendix 3). Measures that were not specifically planned include all of the remaining new wetland acreage (NW1, NW2, NW3, NW4, NW8).

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APPENDIX 1

AREAS OF JURISDICTIONAL FEATURES

TABLE A: AREA OF STREAM SEGMENTS

West Branch Llagas Creek - Main Branch and Minor Tributaries

Stream Segment	Width (feet)	Length (feet)	Area (sq. ft.)	Wetland Characteristics?
1-1	9	580	5,220	No
1-2	9	250	2,250	No
1-3	7.5	1,150	8,625	Yes
1-4	8.5	975	8,288	Yes
1-5	8	550	4,400	Yes
1-6	11	325	3,575	Yes
1-7	7	425	2,975	Yes
1-8	4	275	1,100	Yes
1-9	6	725	4,350	Yes
1-10	4	750	3,000	Yes
1-11	3	775	2,325	Yes
1-12	8	625	5,000	Yes
1-13	8	300	2,400	Yes
1-14	10	200	2,000	Yes
1-15	3	775	2,325	Yes
1-16	7	300	2,100	Yes
1-17	10	350	3,500	Yes
1-18	15	700	10,500	Yes
1-19	1.5	350	525	Yes
1-20	1	600	600	Yes
1-21	6	150	900	No
1-22	8	200	1,600	No
1-23	6	300	1,800	No
1-24	7	290	2,030	No
Culvert 1-24	4	110	440	No
1-25	5	125	625	No
1-26	6	325	1,950	No
1-27	9	200	1,800	No
Subtotal		**12,680**	**86,203**	**67,588**

Minor Tributaries

2-1	2	170	340	No
Subtotal		**170**	**340**	**0**

Tributary #1

Stream Segment	Width (feet)	Length (feet)	Area (sq. ft.)	Wetland Characteristics?
2-2	3	150	450	No
2-3	2	50	100	No
3-2	8	60	480	No
3-3	15	250	3,750	Yes
3-4	1	450	450	Yes
3-5	2	350	700	Yes
3-6	3	610	1,830	Yes
3-9	2	70	140	No
3-10	3	150	450	No
3-11	8	275	2,200	No
3-12	4	125	500	No
N-1	5	200	1,000	Yes
N-2	3	230	690	Yes
N-3	10	90	900	Yes
N-4	2	100	200	Yes
N-5	6	100	600	Yes
N-6	5	70	350	Yes
Culvert N-6	2	35	70	No
N-7	3	50	150	Yes
Culvert N-7	2	35	70	No
N-8	3	60	180	Yes
N-9	5	50	250	Yes
N-10	8	150	1,200	Yes
Culvert N-10	2	24	48	No
N-11	4	140	560	Yes
N-12	6	160	960	Yes
N-13	8	100	800	Yes
N-14	6	270	1,620	Yes
Subtotal		**4,404**	**20,698**	**16,400**

Tributary #2

Stream Segment	Width (feet)	Length (feet)	Area (sq. ft.)	Wetland Characteristics?
2-4	7	100	700	Yes
2-5	2	50	100	Yes

Stream Segment	Width (feet)	Length (feet)	Area (sq. ft.)	Wetland Characteristics?
2-6	5	600	3,000	Yes
2-7	15	150	2,250	Yes
2-8	2	450	900	Yes
2-9	4	400	1,600	Yes
2-10	1.5	200	300	Yes
2-11	1	375	375	Yes
3-13	4	1,260	5,040	Yes
3-22	2	100	200	Yes
Subtotal		**3,685**	**14,465**	**14,465**

Tributary #3

Stream Segment	Width (feet)	Length (feet)	Area (sq. ft.)	Wetland Characteristics?
2-17	3	715	2,145	Yes
2-17a	3	310	930	Yes
2-18	6	300	1,800	Yes
2-19	15	150	2,250	Yes
2-20	5	775	3,875	Yes
2-21	2	275	550	Yes
2-22	5	100	500	Yes
2-23	1	200	200	Yes
3-14	5	225	1,125	Yes
4-3	5	125	625	Yes
4-4	3	700	2,100	Yes
4-5	1	150	150	Yes
4-6	1.5	1,150	1,725	Yes
N-15	3	150	450	No
Culvert N-15	6	12	72	No
N-16	2	90	180	Yes
N-17	3	80	240	Yes
N-18	4	100	400	Yes
Culvert N-18	2	10	20	No
N-19	10	90	900	Yes
N-20	2	90	180	Yes
Subtotal		**5,797**	**20,417**	**19,875**

Tributary #4

Stream Segment	Width (feet)	Length (feet)	Area (sq. ft.)	Wetland Characteristics?
2-24	2	515	1,030	No
3-15	1	375	375	No
3-16	1	275	275	No
Subtotal		**1,165**	**1,680**	**0**

Tributary #5

Stream Segment	Width (feet)	Length (feet)	Area (sq. ft.)	Wetland Characteristics?
2-28	8	250	2,000	Yes
2-29	4	200	800	Yes
2-30	8	225	1,800	Yes
2-31	1	450	450	Yes
N-25	4	600	2,400	Yes
Culvert N-25	2	24	48	No
Rip Rap Spillway-1	15	75	1,125	No
Rip Rap Spillway-2	8	100	800	No
Rip Rap Spillway Culvert	6	30	180	No
Subtotal		**1,954**	**9,603**	**7,450**

Tributary #6

Stream Segment	Width (feet)	Length (feet)	Area (sq. ft.)	Wetland Characteristics?
2-35	2	250	500	Yes
3-17	1	425	425	Yes
3-18	2	150	300	Yes
3-19	8	200	1,600	Yes
3-21	8	560	4,480	Yes
4-7	3	125	375	Yes
N-21	12	180	2,160	Yes
N-22	15	180	2,700	Yes
N-23	10	500	5,000	Yes
N-24	7	200	1,400	Yes
Culvert N-24	2	6	12	No
Subtotal		**2,776**	**18,952**	**18,940**

Tributary #7

Stream Segment	Width (feet)	Length (feet)	Area (sq. ft.)	Wetland Characteristics?
2-36	1.5	250	375	Yes
2-37	3	550	1,650	Yes
2-38	2	150	300	Yes
2-39	1.5	200	300	Yes
Subtotal		**1,150**	**2,625**	**2,625**

Tributary #8

Stream Segment	Width (feet)	Length (feet)	Area (sq. ft.)	Wetland Characteristics?
2-40	1	300	300	Yes
2-41	1	325	325	Yes
2-42	3	160	480	Yes
Subtotal		**785**	**1,105**	**1,105**

Drainage A

Stream Segment	Width (feet)	Length (feet)	Area (sq. ft.)	Wetland Characteristics?
1-1	9	250	2,250	Yes
1-2	5	875	4,375	Yes
1-3	2.5	425	1,063	Yes
2-1	1.5	785	1,178	Yes
2-2	1.5	770	1,155	Yes
2-3	2	400	800	Yes
Subtotal		**3,505**	**10,821**	**10,821**

Drainage B

Stream Segment	Width (feet)	Length (feet)	Area (sq. ft.)	Wetlands Characteristics?
1-1	5	300	1,500	Yes
2-1	1	350	350	Yes
Subtotal		**650**	**1,850**	**1,850**

Drainage C

Stream Segment	Width (feet)	Length (feet)	Area (sq. ft.)	Wetland Characteristics?
1-1	3	75	225	Yes
1-2	3	160	480	Yes
1-3	3	40	120	Yes
1-4	3	175	525	Yes
1-5	8	50	400	Yes
Subtotal		**500**	**1,750**	**1,750**

Drainage Ditches

Stream Segment	Width (feet)	Length (feet)	Area (sq. ft.)	Wetland Characteristics
DD-1	10	35	350	Yes
DD-2	2	100	200	No
Subtotal		**135**	**550**	**350**

Total Area of Stream Segments

Location	Length (feet)	Area (sq. ft.)	Area (acres)
West Branch Llagas Creek and Minor Tributaries	12,850	86,543	1.99
Tributary 1	4,404	20,698	0.48
Tributary 2	3,685	14,465	0.33
Tributary 3	5,797	20,417	0.47
Tributary 4	1,165	1,680	0.04
Tributary 5	1,954	9,603	0.22
Tributary 6	2,776	18,952	0.44
Tributary 7	1,150	2,625	0.06
Tributary 8	785	1,105	0.03
Subtotal West Branch	**34,566**	**176,088**	**4.04**
Other Drainages			
Drainage A	3,505	10,821	0.25
Drainage B	650	1,850	0.04
Drainage C	500	1,750	0.04
Drainage Ditches	135	550	0.01
Subtotal Other Drainages	**4,790**	**14,971**	**0.34**
TOTAL	**39,356**	**191,059**	**4.39**

TABLE B: AREA OF SEEPS

Seep	Area	Wetland Characteristics?
S1	1,500	Yes
S2	800	Yes
S4	1,225	Yes
S5	600	Yes
S6	200	Yes
S7	1,000	Yes
S8	4,900	Yes
S10	1,600	Yes
S11	4,030	Yes
S12	670	Yes
S13	1,885	Yes
S14	560	Yes
S15	810	Yes
TOTAL (sq. ft.)	**19,780**	**19,780**
(acres)	**0.45**	**0.45**

TABLE C: AREA OF STOCKPONDS

Pond	Area (Sq. ft.)	Wetland Characteristics?
P1	9,800	Yes
P2	2,700	Yes
P3	1,000	Yes
P4	1,500	No
P5	900	Yes
P6	675	Yes
P7	43,775	Yes
P8	3,500	Yes
P10	2,975	Yes
TOTAL (sq. ft.)	**66,825**	**65,325**
(acres)	**1.53**	**1.50**

TABLE D: AREA OF GOLF COURSE PONDS

Pond	Area (Sq. ft.)	Wetland Characteristics?
Hole 8 Pond	43,920	No
Hole 18 Pond	15,540	No
Irrigation Pond	117,350	No
TOTAL (sq. ft.)	**176,810**	**0**
(acres)	**4.06**	**0.00**

TABLE E: AREA OF WETLANDS

Wetland	Area (Sq. ft.)	Wetland Characteristics?
W1	33,540	Yes
W2	2,610	Yes
W3	11,140	Yes
W4	13,710	Yes
Mitigation Pond 3	12,360	Yes
NW 1	7,510	Yes
NW 2	13,180	Yes
NW 3	11,140	Yes
NW 4	3,780	Yes
NW 5	46,000	Yes
NW 6	4,340	Yes
NW 7	10,100	Yes
NW 8	1,980	Yes
TOTAL (sq. ft.) (acres)	**171,390 3.93**	**171,390 3.93**

TABLE F: TOTAL WATERS OF THE U.S.

Type	Area (sq. ft.)	Area (ac.)	Wetland Total (sq. ft.)	Wetland Total (ac.)
Streams	191,059	4.39	161,764	3.71
Seeps	19,780	0.45	19,780	0.45
Stock Ponds	66,825	1.53	65,325	1.50
Golf Course Ponds	176,810	4.06	0	0.00
Wetlands	171,390	3.93	171,390	3.93
Drainage Ditch	550	0.01	350	0.01
Total Waters of the U.S.	**626,414**	**14.38**	**418,609**	**9.61**

TABLE G: NON JURISDICTIONAL WATERS

Feature	Area
Detention Basin	41,700
Ornamental Ponds	1,054,690
TOTAL (sq. ft.)	**1,096,390**
(acres)	**25.17**

APPENDIX 2

FIELD DATA SHEETS

(Sample Points 1-16)

DATA FORM: ROUTINE WETLAND DETERMINATION (1987 COE Wetlands Delineation Manual)

Project/Site:	CordeValle Golf Club
Applicant:	CordeValle Golf Club
Investigator(s):	S. Lohmann, C. Lawrence
	LSA Associates, Inc., 157 Park Place, Point Richmond, CA 94801
Have vegetation, soils, or hydrology been disturbed?	Yes No GOLF COURSE GRADING
Is the area a potential Problem Area?	Yes ~~No~~

Sample Site No.:	1
Date:	July 22-24, 2003
Location:	San Martin
County:	Santa Clara
State:	CA

VEGETATION (Note those species observed to have morphological adaptations to wetlands with an asterisk "*")

Dominant Plant Species	% Cover	Indicator	Associated Plant Species	% Cover	Indicator
1. ELYMUS GLAUCUS	25	FACU	1. EPILOBIUM SP.	5	(FAC)
2. PICRIS ECHIOIDES	48	FAC	2. RUMEX CRISPUS	1	FACW
3. POLYPOGON MONSPELIENSIS	20	FACW	3. CYPERUS ERAGROSTIS	1	FACW
4.			4.		
5.			5.		
6.			6.		
7.			7.		

67 % dominant species that are OBL, FACW or FAC (except FAC-). Ø % bare ground

Remarks:

HYDROLOGY

Field observations:
Depth of surface water: Ø (in.)
Depth to free water in pit: " (in.)
Depth to saturated soil: " (in.)

Approximate slope: ~5%
Within 100-year floodplain? Yes No
Below OHWM or High Tide Line? Yes No

Wetland hydrology indicators:

___	Inundated	___	Saturated in upper 12"
___	Water marks	___	Organic duff layer
___	Sediment deposits	___	Drainage patterns in wetlands
___	Suppressed vegetation	___	Oxidized root channels
___	Matting (algal or other)		
___	Other (explain in remarks)		

Physiographic position of site/Remarks: LOCATED IN ARTIFICIAL GULLY BETWEEN GOLF HOLES. GULLY SERVES AS DRAINAGE CHANNEL. SOIL MOIST, BUT NOT WET. NO EVIDENCE OF SURFACE FLOW OR PONDING.

SOILS

Map unit name: GRADED
Taxonomy (subgroup):

Soil series permeability (from NRCS survey):
Field observations confirm mapped soil series? Yes No

Depth (inches)	Horizon	Matrix Color (~~moist~~) dry	~~Redoximorphic~~ Colors (moist)	Abundance/Contrast	Additional observations (texture, concretions, porosity, etc.)
		10 YR 4/1	10 YR 5/6	3%	
		10 YR 5/4	7.5 YR 5/6		

Hydric Soil Indicators:

___	Abundant rhizospheres	___	Gleying	___	Probable aquic moisture regime
___	Reducing conditions	___	Non-mollic, low-chroma colors	___	Concretions
___	High organic content in surface layer	___	Iron or Mn mottles	___	Listed on county hydric soils list
___	Depleted mottles or matrix	___	Sulfidic odor	___	Other (explain in remarks)

Remarks: Mottling probably not redoxymorphic

WETLAND DETERMINATION

Hydrophytic vegetation present	Yes	No
Hydric soils present	Yes	No
Wetland hydrology present	Yes	No

Is this sampling point within a wetland? Yes No

Remarks:

DATA FORM: ROUTINE WETLAND DETERMINATION (1987 COE Wetlands Delineation Manual)

Project/Site: CordeValle Golf Club
Applicant: CordeValle Golf Club
Investigator(s): S. Lohmann, C. Lawrence
LSA Associates, Inc., 157 Park Place, Point Richmond, CA 94801
Have vegetation, soils, or hydrology been disturbed? Yes No GOLF COURSE GRADING
Is the area a potential Problem Area? Yes No

Sample Site No.: 2
Date: July 22-24, 2003
Location: San Martin
County: Santa Clara
State: CA

VEGETATION (Note those species observed to have morphological adaptations to wetlands with an asterisk "*")

Dominant Plant Species	% Cover	Indicator	Associated Plant Species	% Cover	Indicator
1. Epilobium sp.	94	FAC OR FACW	1. Lythrum sp. (hy.)	2	FACW
2.			2. Picris echioides	1	FAC
3.			3. Cyperus eragrostis	1	FACW
4.			4. Rumex crispus	2	FACW
5.			5.		
6.			6.		
7.			7.		

_____% dominant species that are OBL, FACW or FAC (except FAC-). _____% bare ground

Remarks: Willows + cattails nearby.

HYDROLOGY

Field observations:
Depth of surface water: 0 (in.)
Depth to free water in pit: SURFACE (in.)
Depth to saturated soil: SURFACE (in.)

Approximate slope: _____
Within 100-year floodplain? Yes No
Below OHWM or High Tide Line? Yes No

Wetland hydrology indicators:
- _____ Inundated
- _____ Water marks
- _____ Sediment deposits
- _____ Suppressed vegetation
- _____ Matting (algal or other)
- _____ Other (explain in remarks)
- X Saturated in upper 12"
- _____ Organic duff layer
- _____ Drainage patterns in wetlands
- _____ Oxidized root channels

Physiographic position of site/Remarks: Site located in gully between golf holes. Saturated to surface with irrigation runoff. Standing water nearby.

SOILS

Map unit name: _____
Taxonomy (subgroup): _____
Soil series permeability (from NRCS survey): _____
Field observations confirm mapped soil series? Yes No

Depth (inches)	Horizon	Matrix Color (moist)	Redoximorphic Colors (moist)	Abundance/Contrast	Additional observations (texture, concretions, porosity, etc.)
0 - 8		5Y 3 1			gleyed

Hydric Soil Indicators:
- _____ Abundant rhizospheres
- _____ Reducing conditions
- ✓ High organic content in surface layer
- ✓ Depleted mottles or matrix
- ✓ Gleying
- _____ Non-mollic, low-chroma colors
- _____ Iron or Mn mottles
- _____ Sulfidic odor
- _____ Probable aquic moisture regime
- _____ Concretions
- _____ Listed on county hydric soils list
- _____ Other (explain in remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic vegetation present Yes No
Hydric soils present Yes No
Wetland hydrology present Yes No

Is this sampling point within a wetland? Yes No

Remarks:

DATA FORM: ROUTINE WETLAND DETERMINATION (1987 COE Wetlands Delineation Manual)

Project/Site:	CordeValle Golf Club	Sample Site No.:	3
Applicant:	CordeValle Golf Club	Date:	July 22-24, 2003
Investigator(s):	S. Lohmann, C. Lawrence	Location:	San Martin
	LSA Associates, Inc., 157 Park Place, Point Richmond, CA 94801	County:	Santa Clara
Have vegetation, soils, or hydrology been disturbed?	Yes No	State:	CA
Is the area a potential Problem Area?	Yes No		

VEGETATION (Note those species observed to have morphological adaptations to wetlands with an asterisk "*")

Dominant Plant Species	% Cover	Indicator	Associated Plant Species	% Cover	Indicator
1. Hordium marinum	20	FAC	1. Clover	10	?
2. Bromus hordeaceus	44	FACU	2. Carduus pycnocephalus	1	UPL
3. Holocarpha sp.	25	UPLAND	3.		
4.			4.		
5.			5.		
6.			6.		
7.			7.		

33 % dominant species that are OBL, FACW or FAC (except FAC-). NONE % bare ground

Remarks:

HYDROLOGY

Field observations:
Depth of surface water: NONE (in.)
Depth to free water in pit: " (in.)
Depth to saturated soil: " (in.)

Approximate slope: < 2%
Within 100-year floodplain? Yes No
Below OHWM or High Tide Line? Yes No

Wetland hydrology indicators:

____	Inundated	____	Saturated in upper 12"
____	Water marks	____	Organic duff layer
____	Sediment deposits	____	Drainage patterns in wetlands
____	Suppressed vegetation	____	Oxidized root channels
____	Matting (algal or other)		
____	Other (explain in remarks)		

Physiographic position of site/Remarks: Located in site mapped as seep. No current evidence of wetland hydrology.

SOILS

Map unit name: VERTISOL
Taxonomy (subgroup):
Soil series permeability (from NRCS survey):
Field observations confirm mapped soil series? Yes No

Depth (inches)	Horizon	Matrix Color ~~(moist)~~ Dry	Redoximorphic Colors (moist)	Abundance/Contrast	Additional observations (texture, concretions, porosity, etc.)
0-10"		10 YR 2/1	—		Clay - DEEPLY CRACKED

Hydric Soil Indicators:

____	Abundant rhizospheres	____	Gleying	____	Probable aquic moisture regime
____	Reducing conditions	____	Non-mollic, low-chroma colors	____	Concretions
____	High organic content in surface layer	____	Iron or Mn mottles	____	Listed on county hydric soils list
____	Depleted mottles or matrix	____	Sulfidic odor	____	Other (explain in remarks)

Remarks: Vertisol - LOW CHROMA IS NORMAL FOR THIS SOIL TYPE

WETLAND DETERMINATION

Hydrophytic vegetation present	Yes	No
Hydric soils present	Yes	No
Wetland hydrology present	Yes	No

Is this sampling point within a wetland? Yes No

Remarks:

DATA FORM: ROUTINE WETLAND DETERMINATION (1987 COE Wetlands Delineation Manual)

Project/Site:	CordeValle Golf Club	Sample Site No.:	4
Applicant:	CordeValle Golf Club	Date:	July 22-24, 2003
Investigator(s):	S. Lohmann, C. Lawrence LSA Associates, Inc., 157 Park Place, Point Richmond, CA 94801	Location:	San Martin
		County:	Santa Clara
		State:	CA

Have vegetation, soils, or hydrology been disturbed? Yes ~~No~~ GOLF COURSE GRADING

Is the area a potential Problem Area? Yes No

VEGETATION (Note those species observed to have morphological adaptations to wetlands with an asterisk "*")

Dominant Plant Species	% Cover	Indicator	Associated Plant Species	% Cover	Indicator
1. Lolium multiflorum	88	FAC	1. Hordeum brachyantherum	10	FACW
2.			2. Brassica sp.	1	UPL
3.			3. Polypogon monspeliensis	1	FACW
4.			4.		
5.			5.		
6.			6.		
7.			7.		

100 % dominant species that are OBL, FACW or FAC (except FAC-). ______ % bare ground

Remarks:

HYDROLOGY

Field observations:
Depth of surface water: NONE (in.)
Depth to free water in pit: NONE (in.)
Depth to saturated soil: NONE (in.)

Approximate slope: 5%
Within 100-year floodplain? Yes No
Below OHWM or High Tide Line? Yes No

Wetland hydrology indicators:

______	Inundated	______	Saturated in upper 12"
______	Water marks	______	Organic duff layer
______	Sediment deposits	______	Drainage patterns in wetlands
______	Suppressed vegetation	X	Oxidized root channels
______	Matting (algal or other)		
______	Other (explain in remarks)		

Physiographic position of site/Remarks: LOCATED IN ARTIFICIAL SWALE. SOIL IS MOIST FROM IRRIGATION RUNOFF, BUT FAR FROM SATURATED.

SOILS

Map unit name: GRADED
Taxonomy (subgroup): ______

Soil series permeability (from NRCS survey): ______
Field observations confirm mapped soil series? Yes No

Depth (inches)	Horizon	Matrix Color (moist)	Redoximorphic Colors (moist)	Abundance/Contrast	Additional observations (texture, concretions, porosity, etc.)
0-10		10YR 4/4	7.5YR 4/4	5-10%	MEDIUM AND FINE - BELOW 8"

Hydric Soil Indicators:

______	Abundant rhizospheres	______	Gleying	______	Probable aquic moisture regime
______	Reducing conditions	______	Non-mollic, low-chroma colors	______	Concretions
______	High organic content in surface layer	______	Iron or Mn mottles	______	Listed on county hydric soils list
______	Depleted mottles or matrix	______	Sulfidic odor	______	Other (explain in remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic vegetation present	Yes	No
Hydric soils present	Yes	No
Wetland hydrology present	Yes	No

Is this sampling point within a wetland? Yes No

Remarks:

DATA FORM: ROUTINE WETLAND DETERMINATION (1987 COE Wetlands Delineation Manual)

Project/Site:	CordeValle Golf Club	Sample Site No.:	5
Applicant:	CordeValle Golf Club	Date:	July 22-24, 2003
Investigator(s):	S. Lohmann, C. Lawrence	Location:	San Martin
	LSA Associates, Inc., 157 Park Place, Point Richmond, CA 94801	County:	Santa Clara
Have vegetation, soils, or hydrology been disturbed?	Yes No GOLF COURSE GRADING	State:	CA
Is the area a potential Problem Area?	Yes No		

VEGETATION (Note those species observed to have morphological adaptations to wetlands with an asterisk "*")

Dominant Plant Species	% Cover	Indicator	Associated Plant Species	% Cover	Indicator
1. Hordium Marinum	60	FAC	1. Bromus Hordeaceous	5	FACU
2. Clover	30	FACU OR	2. Brassica sp	5	UPL/FACU
3.		UPL	3.		
4.			4.		
5.			5.		
6.			6.		
7.			7.		

50 % dominant species that are OBL, FACW or FAC (except FAC-). 0 % bare ground

Remarks:

HYDROLOGY

Field observations:
Depth of surface water: NONE (in.)
Depth to free water in pit: " (in.)
Depth to saturated soil: " (in.)

Approximate slope: 10%
Within 100-year floodplain? Yes ~~No~~
Below OHWM or High Tide Line? Yes No

Wetland hydrology indicators:

______	Inundated	______	Saturated in upper 12"
______	Water marks	______	Organic duff layer
______	Sediment deposits	______	Drainage patterns in wetlands
______	Suppressed vegetation	______	Oxidized root channels
______	Matting (algal or other)		
______	Other (explain in remarks)		

Physiographic position of site/Remarks: On a slope adjacent to a wetland swale. WETLAND hydrology unlikely.

SOILS

Map unit name: GRADED
Taxonomy (subgroup):
Soil series permeability (from NRCS survey):
Field observations confirm mapped soil series? Yes No

Depth (inches)	Horizon	Matrix Color (moist)	Redoximorphic Colors (moist)	Abundance/Contrast	Additional observations (texture, concretions, porosity, etc.)
0-6		10 YR 5/6	—		

Hydric Soil Indicators:

______	Abundant rhizospheres	______	Gleying	______	Probable aquic moisture regime
______	Reducing conditions	______	Non-mollic, low-chroma colors	______	Concretions
______	High organic content in surface layer	______	Iron or Mn mottles	______	Listed on county hydric soils list
______	Depleted mottles or matrix	______	Sulfidic odor	______	Other (explain in remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic vegetation present	Yes	No	Is this sampling point within a wetland? Yes No
Hydric soils present	Yes	No	
Wetland hydrology present	Yes	No	

Remarks:

DATA FORM: ROUTINE WETLAND DETERMINATION (1987 COE Wetlands Delineation Manual)

Project/Site: CordeValle Golf Club
Applicant: CordeValle Golf Club
Investigator(s): S. Lohmann, C. Lawrence
LSA Associates, Inc., 157 Park Place, Point Richmond, CA 94801
Have vegetation, soils, or hydrology been disturbed? Yes No DETENTION BASIN - RECENT
Is the area a potential Problem Area? Yes No

Sample Site No.: 6
Date: July 22-24, 2003
Location: San Martin
County: Santa Clara
State: CA

VEGETATION (Note those species observed to have morphological adaptations to wetlands with an asterisk "*")

Dominant Plant Species	% Cover	Indicator	Associated Plant Species	% Cover	Indicator
1. HORDEUM MARINUM	59	FAC	1. PLANTAGO LANCEOLATA	10	FAC
2. LOLIUM MULTIFLORUM	30	FAC	2. CONVOLVULUS ARVENSIS	1	UPL
3.			3.		
4.			4.		
5.			5.		
6.			6.		
7.			7.		

100 % dominant species that are OBL, FACW or FAC (except FAC-). 40 % bare ground

Remarks:

HYDROLOGY

Field observations:
Depth of surface water: NONE (in.)
Depth to free water in pit: " (in.)
Depth to saturated soil: " (in.)

Approximate slope: ~LEVEL
Within 100-year floodplain? Yes No UNKNOWN
Below OHWM or High Tide Line? Yes No

Wetland hydrology indicators:
- ___ Inundated
- ___ Water marks
- ___ Sediment deposits
- ___ Suppressed vegetation
- ___ Matting (algal or other)
- ___ Other (explain in remarks)
- ___ Saturated in upper 12"
- ___ Organic duff layer
- ___ Drainage patterns in wetlands
- ___ Oxidized root channels

Physiographic position of site/Remarks: LOCATED IN DETENTION BASIN - LARGE BASIN WITH LEVEL BOTTOM, SITE LOCATED IN APPARENT LOW SPOT IN DETENTION BASIN.

SOILS

Map unit name: ___
Taxonomy (subgroup): ___
Soil series permeability (from NRCS survey): ___
Field observations confirm mapped soil series? Yes No

Depth (inches)	Horizon	Matrix Color (moist)	Redoximorphic Colors (moist)	Abundance/Contrast	Additional observations (texture, concretions, porosity, etc.)
0-3		10YR 3/1			CL - CONTAINS PEBBLES AND CHIPS -
					DISTURBED TRANSLOCATED
3-10		10YR 4/1			CLAY

Hydric Soil Indicators:
- ___ Abundant rhizospheres
- ___ Reducing conditions
- ___ High organic content in surface layer
- ___ Depleted mottles or matrix
- ___ Gleying
- ___ Non-mollic, low-chroma colors
- ___ Iron or Mn mottles
- ___ Sulfidic odor
- ___ Probable aquic moisture regime
- ___ Concretions
- ___ Listed on county hydric soils list
- ___ Other (explain in remarks)

Remarks: LOW SOIL CHROMA WAS PRESENT BEFORE CONSTRUCTION OF THE BASIN. NO OTHER EVIDENCE OF RECENT SOIL REDUCTION.

WETLAND DETERMINATION

Hydrophytic vegetation present Yes No
Hydric soils present Yes No
Wetland hydrology present Yes No

Is this sampling point within a wetland? Yes No

Remarks:

DATA FORM: ROUTINE WETLAND DETERMINATION (1987 COE Wetlands Delineation Manual)

Project/Site: CordeValle Golf Club
Applicant: CordeValle Golf Club
Investigator(s): S. Lohmann, C. Lawrence
LSA Associates, Inc., 157 Park Place, Point Richmond, CA 94801
Have vegetation, soils, or hydrology been disturbed? Yes No LOCATED IN EXCAVATED BASIN
Is the area a potential Problem Area? Yes No

Sample Site No.: 7
Date: July 22-24, 2003
Location: San Martin
County: Santa Clara
State: CA

VEGETATION (Note those species observed to have morphological adaptations to wetlands with an asterisk "*")

Dominant Plant Species	% Cover	Indicator	Associated Plant Species	% Cover	Indicator
1. POLYPOGON MONSPELIENSIS	75	FACW	1. TRIPHYSARIA ERIANTHA	5	UPL
2.			2. PLANTAGO LANCEOLATA	5	FAC
3.			3. HORDEUM MARINUM	10	FAC
4.			4. CONVOLVULUS ARVENSIS	5	UPL
5.			5.		
6.			6.		
7.			7.		

____ % dominant species that are OBL, FACW or FAC (except FAC-). ____ % bare ground

Remarks: SITE LOCATED IN RABBIT'SFOOT PATCH. SURROUNDING VEG COMPOSED OF FAC PLANTS.

HYDROLOGY

Field observations:
Depth of surface water: NONE (in.)
Depth to free water in pit: " (in.)
Depth to saturated soil: " (in.)

Approximate slope: ~ LEVEL
Within 100-year floodplain? Yes No ?
Below OHWM or High Tide Line? Yes No

Wetland hydrology indicators:
____ Inundated
____ Water marks
____ Sediment deposits
____ Suppressed vegetation
____ Matting (algal or other)
____ Other (explain in remarks)
____ Saturated in upper 12"
____ Organic duff layer
____ Drainage patterns in wetlands
____ Oxidized root channels

Physiographic position of site/Remarks: LOCATED IN LOWER HALF OF A BROAD DETENTION BASIN. SEDIMENT CHIPS INDICATE AT LEAST EPHEMERAL PONDING.

SOILS

Map unit name: EXCAVATED
Taxonomy (subgroup): ____
Soil series permeability (from NRCS survey): ____
Field observations confirm mapped soil series? Yes No

Depth (inches)	Horizon	Matrix Color (moist)	Redoximorphic Colors (moist)	Abundance/Contrast	Additional observations (texture, concretions, porosity, etc.)
0-2		10YR 4/2	NONE		WASHED IN FROM NEARBY POND BANK
2-10		10YR 4/3	NONE		CLAY SUBSOIL, NOW AT SURFACE
					CONTAINS PEBBLES OF SEVERAL COLORS

Hydric Soil Indicators:
____ Abundant rhizospheres
____ Reducing conditions
____ High organic content in surface layer
____ Depleted mottles or matrix
____ Gleying
____ Non-mollic, low-chroma colors
____ Iron or Mn mottles
____ Sulfidic odor
____ Probable aquic moisture regime
____ Concretions
____ Listed on county hydric soils list
____ Other (explain in remarks)

Remarks: NO EVIDENCE OF REDUCTION

WETLAND DETERMINATION

Hydrophytic vegetation present Yes No
Hydric soils present Yes No
Wetland hydrology present Yes No

Is this sampling point within a wetland? Yes No

Remarks:

DATA FORM: ROUTINE WETLAND DETERMINATION (1987 COE Wetlands Delineation Manual)

Project/Site:	CordeValle Golf Club	Sample Site No.:	8
Applicant:	CordeValle Golf Club	Date:	July 22-24, 2003
Investigator(s):	S. Lohmann, C. Lawrence	Location:	San Martin
	LSA Associates, Inc., 157 Park Place, Point Richmond, CA 94801	County:	Santa Clara
Have vegetation, soils, or hydrology been disturbed?	Yes No EXCAVATED WETLAND	State:	CA
Is the area a potential Problem Area?	Yes No		

VEGETATION (Note those species observed to have morphological adaptations to wetlands with an asterisk "*")

Dominant Plant Species	% Cover	Indicator	Associated Plant Species	% Cover	Indicator
1. SPREADING WEED	38	UNKNOWN	1.		
2. EPILOBIUM BOISDUVALIA	40	FACW	2. EREMOCARPUS SETIGERUS	2	
3. LYTHRUM HYSSOPIFOLIA	20	FACW	3.		
4.			4.		
5.			5.		
6.			6.		
7.			7.		

67+ % dominant species that are OBL, FACW or FAC (except FAC-). 20 % bare ground

Remarks:

HYDROLOGY

Field observations:
Depth of surface water: NONE (in.)
Depth to free water in pit: " (in.)
Depth to saturated soil: " (in.)

Approximate slope: ~LEVEL
Within 100-year floodplain? Yes No
Below OHWM or High Tide Line? Yes No

Wetland hydrology indicators:

	Inundated		Saturated in upper 12"
	Water marks		Organic duff layer
X	Sediment deposits		Drainage patterns in wetlands
X	Suppressed vegetation		Oxidized root channels
	Matting (algal or other)		
	Other (explain in remarks)		

Physiographic position of site/Remarks: LOCATED IN CONSTRUCTED VERNAL POOL. SEDIMENT FLAKING AND SUPPRESSION OF VEGETATION INDICATE LONG-TERM PONDING.

SOILS

Map unit name:
Taxonomy (subgroup):
Soil series permeability (from NRCS survey):
Field observations confirm mapped soil series? Yes No

Depth (inches)	Horizon	Matrix Color (moist)	Redoximorphic Colors (moist)	Abundance/Contrast	Additional observations (texture, concretions, porosity, etc.)
0-8+		10YR 3/2	NONE		ALL INCLUDED ROCK CHIPS ARE RED - POSSIBLE INDICATION OF REDUCTION

Hydric Soil Indicators:

	Abundant rhizospheres		Gleying		Probable aquic moisture regime
	Reducing conditions		Non-mollic, low-chroma colors		Concretions
	High organic content in surface layer		Iron or Mn mottles		Listed on county hydric soils list
	Depleted mottles or matrix		Sulfidic odor		Other (explain in remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic vegetation present	Yes	No	Is this sampling point within a wetland? Yes No
Hydric soils present	Yes	No ?	
Wetland hydrology present	Yes	No	

Remarks: SOIL EVIDENCE IS WEAK, BUT WETLAND CONDITIONS CONFIRMED BY STRONG HYDROLOGIC AND VEGETATIONAL CHARACTERISTICS.

DATA FORM: ROUTINE WETLAND DETERMINATION (1987 COE Wetlands Delineation Manual)

Project/Site: CordeValle Golf Club
Applicant: CordeValle Golf Club
Investigator(s): S. Lohmann, C. Lawrence
LSA Associates, Inc., 157 Park Place, Point Richmond, CA 94801
Have vegetation, soils, or hydrology been disturbed? Yes **No**
Is the area a potential Problem Area? Yes **No**

Sample Site No.: 9
Date: July 22-24, 2003
Location: San Martin
County: Santa Clara
State: CA

VEGETATION (Note those species observed to have morphological adaptations to wetlands with an asterisk "*")

Dominant Plant Species	% Cover	Indicator	Associated Plant Species	% Cover	Indicator
1. HOLOCARPHA VIRGATA	40	UPL	1. TRIFOLIUM SP.	5	UPL
2. HORDEUM MARINUM	5	FAC	2.		
3.			3.		
4.			4.		
5.			5.		
6.			6.		
7.			7.		

50 % dominant species that are OBL, FACW or FAC (except FAC-). Ø % bare ground

Remarks:

HYDROLOGY

Field observations:
Depth of surface water: NONE (in.)
Depth to free water in pit: " (in.)
Depth to saturated soil: " (in.)

Approximate slope: ~3-5%
Within 100-year floodplain? Yes No ?
Below OHWM or High Tide Line? Yes **No**

Wetland hydrology indicators:

____ Inundated
____ Water marks
____ Sediment deposits
____ Suppressed vegetation
____ Matting (algal or other)
____ Other (explain in remarks)
____ Saturated in upper 12"
____ Organic duff layer
____ Drainage patterns in wetlands
____ Oxidized root channels

Physiographic position of site/Remarks: LOCATED IN FIELD ON SLIGHTLY SLOPING SURFACE. ADJACENT TO CONSTRUCTED WETLAND. NO EVIDENCE OF WETLAND HYDROLOGY.

SOILS

Map unit name: ____
Taxonomy (subgroup): ____
Soil series permeability (from NRCS survey): ____
Field observations confirm mapped soil series? Yes No

Depth (inches)	Horizon	Matrix Color (moist)	Redoximorphic Colors (moist)	Abundance/Contrast	Additional observations (texture, concretions, porosity, etc.)
0-8		10YR 3/2	NONE		ROCK CHIPS ARE RED, LIKE AT SITE 8

Hydric Soil Indicators:

____ Abundant rhizospheres
____ Reducing conditions
____ High organic content in surface layer
____ Depleted mottles or matrix
____ Gleying
____ Non-mollic, low-chroma colors
____ Iron or Mn mottles
____ Sulfidic odor
____ Probable aquic moisture regime
____ Concretions
____ Listed on county hydric soils list
____ Other (explain in remarks)

Remarks: NO HYDRIC INDICATORS

WETLAND DETERMINATION

Hydrophytic vegetation present Yes **No**
Hydric soils present Yes **No**
Wetland hydrology present Yes **No**

Is this sampling point within a wetland? Yes **No**

Remarks:

DATA FORM: ROUTINE WETLAND DETERMINATION (1987 COE Wetlands Delineation Manual)

Project/Site: CordeValle Golf Club
Applicant: CordeValle Golf Club
Investigator(s): S. Lohmann, C. Lawrence
LSA Associates, Inc., 157 Park Place, Point Richmond, CA 94801
Have vegetation, soils, or hydrology been disturbed? Yes No
Is the area a potential Problem Area? Yes No

Sample Site No.: 10
Date: July 22-24, 2003
Location: San Martin
County: Santa Clara
State: CA

VEGETATION (Note those species observed to have morphological adaptations to wetlands with an asterisk "*")

Dominant Plant Species	% Cover	Indicator	Associated Plant Species	% Cover	Indicator
1. Lolium multiflorum	85	FAC	1. Bromus hordeaceus	10	FACU
2.			2. Rumex crispus	3	FACW
3.			3. Holocarpha virgata	2	UPL
4.			4.		
5.			5.		
6.			6.		
7.			7.		

100 % dominant species that are OBL, FACW or FAC (except FAC-). Ø % bare ground

Remarks:

HYDROLOGY

Field observations:
Depth of surface water: NONE (in.)
Depth to free water in pit: NONE (in.)
Depth to saturated soil: NONE (in.)

Approximate slope: 5-10 %
Within 100-year floodplain? Yes **No**
Below OHWM or High Tide Line? Yes **No**

Wetland hydrology indicators:

___ Inundated
___ Water marks
___ Sediment deposits
___ Suppressed vegetation
___ Matting (algal or other)
___ Other (explain in remarks)
___ Saturated in upper 12"
___ Organic duff layer
___ Drainage patterns in wetlands
___ Oxidized root channels

Physiographic position of site/Remarks: Sloping field. No evidence of saturation or ponding.

SOILS

Map unit name: ___
Taxonomy (subgroup): ___
Soil series permeability (from NRCS survey): ___
Field observations confirm mapped soil series? Yes No

Depth (inches)	Horizon	Matrix Color (moist)	Redoximorphic Colors (moist)	Abundance/Contrast	Additional observations (texture, concretions, porosity, etc.)
0-7	Ap	10YR 3/2	Ø		Clay
7-12	A	10YR 3/1	Ø		Heavy clay

Hydric Soil Indicators:

___ Abundant rhizospheres
___ Reducing conditions
___ High organic content in surface layer
___ Depleted mottles or matrix
___ Gleying
___ Non-mollic, low-chroma colors
___ Iron or Mn mottles
___ Sulfidic odor
___ Probable aquic moisture regime
___ Concretions
___ Listed on county hydric soils list
___ Other (explain in remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic vegetation present **Yes** No
Hydric soils present Yes **No**
Wetland hydrology present Yes **No**

Is this sampling point within a wetland? Yes **No**

Remarks:

DATA FORM: ROUTINE WETLAND DETERMINATION (1987 COE Wetlands Delineation Manual)

Project/Site:	CordeValle Golf Club	Sample Site No.:	11
Applicant:	CordeValle Golf Club	Date:	July 22-24, 2003
Investigator(s):	S. Lohmann, C. Lawrence	Location:	San Martin
	LSA Associates, Inc., 157 Park Place, Point Richmond, CA 94801	County:	Santa Clara
Have vegetation, soils, or hydrology been disturbed?	Yes No EXCAVATED BASIN	State:	CA
Is the area a potential Problem Area?	Yes No		

VEGETATION (Note those species observed to have morphological adaptations to wetlands with an asterisk "*")

Dominant Plant Species	% Cover	Indicator	Associated Plant Species	% Cover	Indicator
1. Lolium multiflorum	48	FAC	1. Picris echioides	2	FAC
2. Hordeum brachyantherum	40	FACW	2. Rumex crispus	10	FACW
3.			3.		
4.			4.		
5.			5.		
6.			6.		
7.			7.		

100 % dominant species that are OBL, FACW or FAC (except FAC-). Ø % bare ground

Remarks:

HYDROLOGY

Field observations:
Depth of surface water: NONE (in.)
Depth to free water in pit: " (in.)
Depth to saturated soil: " (in.)

Approximate slope: 5-10%
Within 100-year floodplain? Yes No
Below OHWM or High Tide Line? Yes No

Wetland hydrology indicators:

____	Inundated	____	Saturated in upper 12"
____	Water marks	____	Organic duff layer
____	Sediment deposits	____	Drainage patterns in wetlands
____	Suppressed vegetation	____	Oxidized root channels
____	Matting (algal or other)		
____	Other (explain in remarks)		

Physiographic position of site/Remarks:
Retention basin. No evidence of wetland hydrology.

SOILS

Map unit name: ____ Soil series permeability (from NRCS survey): ____
Taxonomy (subgroup): ____ Field observations confirm mapped soil series? Yes No

Depth (inches)	Horizon	Matrix Color (moist)	Redoximorphic Colors (moist)	Abundance/Contrast	Additional observations (texture, concretions, porosity, etc.)
0-4		10 YR 5/4	Ø		Coarse

Hydric Soil Indicators:

____	Abundant rhizospheres	____	Gleying	____	Probable aquic moisture regime
____	Reducing conditions	____	Non-mollic, low-chroma colors	____	Concretions
____	High organic content in surface layer	____	Iron or Mn mottles	____	Listed on county hydric soils list
____	Depleted mottles or matrix	____	Sulfidic odor	____	Other (explain in remarks)

Remarks: NO HYDRIC INDICATORS

WETLAND DETERMINATION

Hydrophytic vegetation present	Yes	No
Hydric soils present	Yes	No
Wetland hydrology present	Yes	No

Is this sampling point within a wetland? Yes No

Remarks:

DATA FORM: ROUTINE WETLAND DETERMINATION (1987 COE Wetlands Delineation Manual)

Project/Site: CordeValle Golf Club
Applicant: CordeValle Golf Club
Investigator(s): S. Lohmann, C. Lawrence
LSA Associates, Inc., 157 Park Place, Point Richmond, CA 94801
Have vegetation, soils, or hydrology been disturbed? Yes No EXCAVATED BASIN
Is the area a potential Problem Area? Yes No

Sample Site No.: 12
Date: July 22-24, 2003
Location: San Martin
County: Santa Clara
State: CA

VEGETATION (Note those species observed to have morphological adaptations to wetlands with an asterisk "*")

Dominant Plant Species	% Cover	Indicator	Associated Plant Species	% Cover	Indicator
1. Typha sp.	20	OBL	1. Cyperus eragrostis	2	FACW
2. Rumex conglomeratus	20	FACW	2. Crypsis schoenoides	8	OBL
3. Eleocharis sp	25	OBL	3.		
4. Spergularia sp.	25		4.		
5.			5.		
6.			6.		
7.			7.		

75+ % dominant species that are OBL, FACW or FAC (except FAC-). 35 % bare ground

Remarks:

HYDROLOGY

Field observations:
Depth of surface water: NONE (in.)
Depth to free water in pit: " (in.)
Depth to saturated soil: " (in.)

Approximate slope: ~ LEVEL
Within 100-year floodplain? Yes No
Below OHWM or High Tide Line? Yes No

Wetland hydrology indicators:
- ___ Inundated
- ___ Water marks
- X Sediment deposits
- X Suppressed vegetation
- X Matting (algal or other)
- ___ Other (explain in remarks)
- ___ Saturated in upper 12"
- ___ Organic duff layer
- ___ Drainage patterns in wetlands
- ___ Oxidized root channels

Physiographic position of site/Remarks: LOCATED IN LOW POINT IN RETENTION BASIN FLOOR. CLEAR EVIDENCE OF WETLAND HYDROLOGY.

SOILS

Map unit name:
Taxonomy (subgroup):
Soil series permeability (from NRCS survey):
Field observations confirm mapped soil series? Yes No

Depth (inches)	Horizon	Matrix Color (moist)	Redoximorphic Colors (moist)	Abundance/Contrast	Additional observations (texture, concretions, porosity, etc.)
0-4		10 YR 4/4,	7.5 YR 4/4,	2.5 Y 5/3	Coarse, sandy
4-8		7.5 YR 4/6	5 YR 4/6		clay

Hydric Soil Indicators:
- ___ Abundant rhizospheres
- ___ Reducing conditions
- ___ High organic content in surface layer
- ___ Depleted mottles or matrix
- ___ Gleying
- ___ Non-mollic, low-chroma colors
- X Iron or Mn mottles
- ___ Sulfidic odor
- ___ Probable aquic moisture regime
- ___ Concretions
- ___ Listed on county hydric soils list
- ___ Other (explain in remarks)

Remarks: SOIL MOTTLING MAY BE INFLUENCED BY REDUCTION

WETLAND DETERMINATION

Hydrophytic vegetation present Yes No
Hydric soils present Yes No
Wetland hydrology present Yes No

Is this sampling point within a wetland? Yes No

Remarks:

DATA FORM: ROUTINE WETLAND DETERMINATION (1987 COE Wetlands Delineation Manual)

Project/Site: CordeValle Golf Club
Applicant: CordeValle Golf Club
Investigator(s): S. Lohmann, C. Lawrence
LSA Associates, Inc., 157 Park Place, Point Richmond, CA 94801
Have vegetation, soils, or hydrology been disturbed? **Yes** No GRADED, IRRIGATION RUNOFF
Is the area a potential Problem Area? Yes **No**

Sample Site No.: 13
Date: July 22-24, 2003
Location: San Martin
County: Santa Clara
State: CA

VEGETATION (Note those species observed to have morphological adaptations to wetlands with an asterisk "*")

Dominant Plant Species	% Cover	Indicator	Associated Plant Species	% Cover	Indicator
1. Juncus Xiphioides (Iris leaf rush)	80	OBL	1. Rumex crispus	3	FACW
2.			2. Polypogon MONSPELIENSIS	5	FACW
3.			3. Circium sp	2	UPL
4.			4. Lythrum hyssopifolia	10	FACW
5.			5.		
6.			6.		
7.			7.		

100 % dominant species that are OBL, FACW or FAC (except FAC-). Ø % bare ground

Remarks:

HYDROLOGY

Field observations:
Depth of surface water: NONE (in.)
Depth to free water in pit: " (in.)
Depth to saturated soil: " (in.)

Approximate slope: <2%
Within 100-year floodplain? **Yes** No
Below OHWM or High Tide Line? **Yes** No

Wetland hydrology indicators:
- ___ Inundated
- ___ Water marks
- ___ Sediment deposits
- ✓ Suppressed vegetation
- ___ Matting (algal or other)
- ___ Other (explain in remarks)
- ___ Saturated in upper 12"
- ___ Organic duff layer
- ___ Drainage patterns in wetlands
- ___ Oxidized root channels

Physiographic position of site/Remarks: Located in channelized stream. Site located in streambed. SOIL MOIST, NOT SATURATED.

SOILS

Map unit name: ______
Taxonomy (subgroup): ______
Soil series permeability (from NRCS survey): ______
Field observations confirm mapped soil series? Yes No

Depth (inches)	Horizon	Matrix Color (moist)	Redoximorphic Colors (moist)	Abundance/Contrast	Additional observations (texture, concretions, porosity, etc.)
0-8		2.5 Y 5/3	10 YR 3/6	5%	sandy alluvium

Hydric Soil Indicators:
- ___ Abundant rhizospheres
- ___ Reducing conditions
- ___ High organic content in surface layer
- ___ Depleted mottles or matrix
- ___ Gleying
- ___ Non-mollic, low-chroma colors
- ___ Iron or Mn mottles
- ___ Sulfidic odor
- ___ Probable aquic moisture regime
- ___ Concretions
- ___ Listed on county hydric soils list
- ___ Other (explain in remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic vegetation present **Yes** No
Hydric soils present **Yes** No
Wetland hydrology present **Yes** No

Is this sampling point within a wetland? **Yes** No

Remarks:

DATA FORM: ROUTINE WETLAND DETERMINATION (1987 COE Wetlands Delineation Manual)

Project/Site:	CordeValle Golf Club	Sample Site No.:	14
Applicant:	CordeValle Golf Club	Date:	July 22-24, 2003
Investigator(s):	S. Lohmann, C. Lawrence	Location:	San Martin
	LSA Associates, Inc., 157 Park Place, Point Richmond, CA 94801	County:	Santa Clara
Have vegetation, soils, or hydrology been disturbed?	Yes No GRADED	State:	CA
Is the area a potential Problem Area?	Yes No		

VEGETATION (Note those species observed to have morphological adaptations to wetlands with an asterisk "*")

Dominant Plant Species	% Cover	Indicator	Associated Plant Species	% Cover	Indicator
1. Raphanus sativa (wild raddish)	75	UPL	1. Picris echioides	10	FAC
2.			2. Brassica sp	10	UPL
3.			3. Rumex crispus	5	FACW
4.			4.		
5.			5.		
6.			6.		
7.			7.		

Ø % dominant species that are OBL, FACW or FAC (except FAC-). Ø % bare ground

Remarks:

HYDROLOGY

Field observations:
Depth of surface water: NONE (in.)
Depth to free water in pit: " (in.)
Depth to saturated soil: " (in.)

Approximate slope: 30 %
Within 100-year floodplain? Yes No UNKNOWN
Below OHWM or High Tide Line? Yes No

Wetland hydrology indicators:

____	Inundated	____	Saturated in upper 12"
____	Water marks	____	Organic duff layer
____	Sediment deposits	____	Drainage patterns in wetlands
____	Suppressed vegetation	____	Oxidized root channels
____	Matting (algal or other)		
____	Other (explain in remarks)		

Physiographic position of site/Remarks: Fill embankment adjacent to creek
No evidence of wetland hydrology. ABOVE OHWM

SOILS

Map unit name: Fill
Taxonomy (subgroup):
Soil series permeability (from NRCS survey):
Field observations confirm mapped soil series? Yes No

Depth (inches)	Horizon	Matrix Color (moist)	Redoximorphic Colors (moist)	Abundance/Contrast	Additional observations (texture, concretions, porosity, etc.)
0-10		10 YR 3/2	Ø		Fill

Hydric Soil Indicators:

____	Abundant rhizospheres	____	Gleying	____	Probable aquic moisture regime
____	Reducing conditions	____	Non-mollic, low-chroma colors	____	Concretions
____	High organic content in surface layer	____	Iron or Mn mottles	____	Listed on county hydric soils list
____	Depleted mottles or matrix	____	Sulfidic odor	____	Other (explain in remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic vegetation present	Yes	No
Hydric soils present	Yes	No
Wetland hydrology present	Yes	No

Is this sampling point within a wetland? Yes No

Remarks:

DATA FORM: ROUTINE WETLAND DETERMINATION (1987 COE Wetlands Delineation Manual)

Project/Site:	CordeValle Golf Club	Sample Site No.:	15
Applicant:	CordeValle Golf Club	Date:	July 22-24, 2003
Investigator(s):	S. Lohmann, C. Lawrence	Location:	San Martin
	LSA Associates, Inc., 157 Park Place, Point Richmond, CA 94801	County:	Santa Clara
Have vegetation, soils, or hydrology been disturbed?	Yes No	State:	CA
Is the area a potential Problem Area?	Yes No		

VEGETATION (Note those species observed to have morphological adaptations to wetlands with an asterisk "*")

Dominant Plant Species	% Cover	Indicator	Associated Plant Species	% Cover	Indicator
1. Juncas xiphiodes	90	OBL	1. Rumex crispus	10	FACW
2.			2.		
3.			3.		
4.			4.		
5.			5.		
6.			6.		
7.			7.		

100 % dominant species that are OBL, FACW or FAC (except FAC-). Ø % bare ground

Remarks: Also - Polypogon monspeliensis nearby

HYDROLOGY

Field observations:
Depth of surface water: None (in.)
Depth to free water in pit: " (in.)
Depth to saturated soil: " (in.)

Approximate slope: ~10%
Within 100-year floodplain? Yes No
Below OHWM or High Tide Line? Yes No

Wetland hydrology indicators:

___	Inundated	___	Saturated in upper 12"
___	Water marks	___	Organic duff layer
___	Sediment deposits	___	Drainage patterns in wetlands
___	Suppressed vegetation	X	Oxidized root channels
___	Matting (algal or other)		
___	Other (explain in remarks)		

Physiographic position of site/Remarks: Located in apparent seep on moderately-sloped hillside

SOILS

Map unit name: ____
Taxonomy (subgroup): ____
Soil series permeability (from NRCS survey): ____
Field observations confirm mapped soil series? Yes No

Depth (inches)	Horizon	Matrix Color (moist)	Redoximorphic Colors (moist)	Abundance/Contrast	Additional observations (texture, concretions, porosity, etc.)
0 - 10		10YR 3/1	7.5YR 3/4	~~BM~~ 10%	

Hydric Soil Indicators:

___	Abundant rhizospheres	___	Gleying	___	Probable aquic moisture regime
___	Reducing conditions	___	Non-mollic, low-chroma colors	___	Concretions
___	High organic content in surface layer	X	Iron or Mn mottles	___	Listed on county hydric soils list
___	Depleted mottles or matrix	___	Sulfidic odor	___	Other (explain in remarks)

Remarks: Fine RL and mottles

WETLAND DETERMINATION

Hydrophytic vegetation present	Yes	No	Is this sampling point within a wetland? Yes No
Hydric soils present	Yes	No	
Wetland hydrology present	Yes	No	

Remarks:

DATA FORM: ROUTINE WETLAND DETERMINATION (1987 COE Wetlands Delineation Manual)

Project/Site: CordeValle Golf Club
Applicant: CordeValle Golf Club
Investigator(s): S. Lohmann, C. Lawrence
LSA Associates, Inc., 157 Park Place, Point Richmond, CA 94801
Have vegetation, soils, or hydrology been disturbed? Yes No
Is the area a potential Problem Area? Yes No

Sample Site No.: 16
Date: July 22-24, 2003
Location: San Martin
County: Santa Clara
State: CA

VEGETATION (Note those species observed to have morphological adaptations to wetlands with an asterisk "*")

Dominant Plant Species	% Cover	Indicator	Associated Plant Species	% Cover	Indicator
1. Lolium multiflorum	45	FAC	1. Rumex crispus	2	FACW
2. Bromus hordaceous	45	FACU	2. Unknown forbs	8	
3.			3.		
4.			4.		
5.			5.		
6.			6.		
7.			7.		

50 % dominant species that are OBL, FACW or FAC (except FAC-). Ø % bare ground

Remarks:

HYDROLOGY

Field observations:
Depth of surface water: NONE (in.)
Depth to free water in pit: " (in.)
Depth to saturated soil: " (in.)

Approximate slope: ~25%
Within 100-year floodplain? Yes No
Below OHWM or High Tide Line? Yes No

Wetland hydrology indicators:
- ____ Inundated
- ____ Water marks
- ____ Sediment deposits
- ____ Suppressed vegetation
- ____ Matting (algal or other)
- ____ Other (explain in remarks)
- ____ Saturated in upper 12"
- ____ Organic duff layer
- ____ Drainage patterns in wetlands
- ✓ Oxidized root channels

Physiographic position of site/Remarks: Located on hillside adjacent to seep.

SOILS

Map unit name: ____
Taxonomy (subgroup): ____
Soil series permeability (from NRCS survey): ____
Field observations confirm mapped soil series? Yes No

Depth (inches)	Horizon	Matrix Color (moist)	Redoximorphic Colors (moist)	Abundance/Contrast	Additional observations (texture, concretions, porosity, etc.)
0-7		10 YR 3/1.5	5 YR 3/4	3%	

Hydric Soil Indicators:
- ____ Abundant rhizospheres
- ____ Reducing conditions
- ____ High organic content in surface layer
- ____ Depleted mottles or matrix
- ____ Gleying
- ____ Non-mollic, low-chroma colors
- ____ Iron or Mn mottles
- ____ Sulfidic odor
- ____ Probable aquic moisture regime
- ____ Concretions
- ____ Listed on county hydric soils list
- ____ Other (explain in remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic vegetation present Yes No
Hydric soils present Yes No
Wetland hydrology present Yes No

Is this sampling point within a wetland? Yes No

Remarks: EVIDENCE OF PREVIOUS REDUCTION IN SOIL DOES NOT PROVE THAT THE SITE MEETS WETLAND HYDROLOGIC CRITERIA OVER THE LONG TERM.

APPENDIX 3

IMPACTS ANALYSIS

Note: All features that have been altered in some fashion since the original 1997 delineation are represented in *italicized* text. Features represented in normal text are essentially unchanged since 1997. This convention applies to all tables in Appendix 3.

TABLE A: STREAM SEGMENT IMPACTS

West Branch Llagas Creek - Main Branch and Minor Tributaries

Stream Segment	1997 Area (sq. ft.)	2003 Area (sq. ft.)	Difference	Comment	Impacts (sq. ft.)	Mitigation Credit
1-1	5,220	5,220	0	No change	0	0
1-2	2,250	2,250	0	No change	0	0
1-3	8,625	8,625	0	No change	0	0
Road Bridge 1-3	–	–	–	–	*0*	*0*
Foot Bridge 1-3	–	–	–	*Bridge footing*	*96*	*0*
1-4	8,288	8,288	0	No change	0	0
Bridge 1-4	–	–	–	*Clear span*	*0*	*0*
1-5	4,400	4,400	0	No change	0	0
Bridge 1-5	–	–	–	*Bridge footing*	*80*	*0*
1-6	*1,300*	*3,575*	*2,275*	*Widened stream*	*0*	*2,275*
1-7	2,975	2,975	0	No change	0	0
Bridge 1-7	–	–	–	*Bridge footing*	*80*	*0*
1-8	1,100	1,100	0	No change	0	0
1-9	4,350	4,350	0	No change	0	0
Bridge 1-9	–	–	–	*Bridge footing*	*32*	*0*
1-10	3,000	3,000	0	No change	0	0
Bridge 1-10	–	–	–	*Bridge footing*	*32*	*0*
1-11	2,325	2,325	0	No change	0	0
1-12	5,000	5,000	0	No change	0	0
1-13	2,400	2,400	0	No change	0	0
1-14	2,000	2,000	0	No change	0	0
1-15	2,325	2,325	0	No change	0	0
Bridge 1-15	–	–	–	*Clear span*	*0*	*0*
1-16	2,100	2,100	0	No change	0	0
1-17	3,500	3,500	0	No change	0	0
1-18	10,500	10,500	0	No change	0	0
Culvert 1-18	–	–	–	*Culvert*	*300*	*0*
1-19	525	525	0	No change	0	0
1-20	600	600	0	No change	0	0
1-21	900	900	0	No change	0	0
1-22	1,600	1,600	0	No change	0	0
1-23	1,800	1,800	0	No change	0	0

1-24	2,800	2,030	-770	Stream culverted	770	0
Culvert 1-24	–	440	440	Culvert	0	0
1-25	625	625	0	No change	0	0
1-26	1,950	1,950	0	No change	0	0
1-27	1,800	1,800	0	No change	0	0
Subtotal	**86,258**	**86,203**	**-55**		**1,390**	**2,275**
Minor Tributaries						
2-1	500	340	-160	Stream filled	160	0
2-12	100	0	-100	Stream filled	100	0
Subtotal	**600**	**340**	**-260**		**260**	**0**

Tributary #1

Stream Segment	1997 Area (sq. ft.)	2003 Area (sq. ft.)	Difference	Comment	Impacts (sq. ft.)	Mitigation Credit
2-2	450	450	0	No change	0	0
2-3	2,100	100	-2,000	Stream filled	2,000	0
3-1	400	0	-400	Stream filled	400	0
3-2	600	480	-120	Stream filled	120	0
3-3	3,750	3,750	0	No change	0	0
3-4	450	450	0	No change	0	0
3-5	700	700	0	No change	0	0
3-6	2,250	1,830	-420	Stream filled	420	0
Bridge 3-6	–	–	–	Bridge footing	36	0
3-7	500	0	-500	Stream filled	500	0
3-8	4,063	0	-4,063	Stream filled	4,063	0
3-9	900	140	-760	Stream filled	760	0
3-10	1,800	450	-1,350	Channel width decreased	0	0
3-11	2,200	2,200	0	No change	0	0
3-12	500	500	0	No change	0	0
4-1	150	0	-150	Stream filled	150	
4-2	250	0	-250	Stream filled	250	
N-1	0	1,000	1,000	New stream creation	0	1,000

N-2	*0*	*690*	*690*	*New stream creation*	*0*	*690*
N-3	*0*	*900*	*900*	*New stream creation*	*0*	*900*
N-4	*0*	*200*	*200*	*New stream creation*	*0*	*200*
N-5	*0*	*600*	*600*	*New stream creation*	*0*	*600*
Bridge N-5	–	–	–	*Clear span*	–	–
N-6	*0*	*350*	*350*	*New stream creation*	*0*	*350*
Culvert N-6	–	*70*	*70*	*Culvert*	*0*	*0*
N-7	*0*	*150*	*150*	*New stream creation*	*0*	*150*
Culvert N-7	–	*70*	*70*	*Culvert*	*0*	*0*
N-8	*0*	*180*	*180*	*New stream creation*	*0*	*180*
N-9	*0*	*250*	*250*	*New stream creation*	*0*	*250*
N-10	*0*	*1,200*	*1,200*	*New stream creation*	*0*	*1,200*
Culvert N-10	–	*48*	*48*	*Culvert*	*0*	*0*
N-11	*0*	*560*	*560*	*New stream creation*	*0*	*560*
N-12	*0*	*960*	*960*	*New stream creation*	*0*	*960*
N-13	*0*	*800*	*800*	*New stream creation*	*0*	*800*
N-14	*0*	*1,620*	*1,620*	*New stream creation*	*0*	*1,620*
Subtotal	**21,063**	**20,698**	**-365**		**8,699**	**9,460**

Tributary #2

Stream Segment	1997 Area (sq. ft.)	2003 Area (sq. ft.)	Difference	Cause	Impacts (sq. ft.)	Mitigation Credit
2-4	700	700	0	No change	0	0
2-5	100	100	0	No change	0	0
2-6	3,000	3,000	0	No change	0	0
Culvert 2-6	–	–	–	*Culvert*	*375*	*0*

Stream Segment	1997 Area (sq. ft.)	2003 Area (sq. ft.)	Difference	Cause	Impacts (sq. ft.)	Mitigation Credit
2-7	2,250	2,250	0	No change	0	0
2-8	900	900	0	No change	0	0
2-9	1,600	1,600	0	No change	0	0
2-10	300	300	0	No change	0	0
2-11	375	375	0	No change	0	0
3-13	5,040	5,040	0	No change	0	0
3-22	*670*	*200*	*-470*	*Stream filled*	*470*	*0*
3-23	*2,280*	*0*	*-2,280*	*Stream filled*	*2,280*	*0*
Subtotal	**17,215**	**14,465**	**-2,750**		**3,125**	**0**

Tributary #3

Stream Segment	1997 Area (sq. ft.)	2003 Area (sq. ft.)	Difference	Cause	Impacts (sq. ft.)	Mitigation Credit
2-13	*350*	*0*	*-350*	*Stream filled*	*350*	*0*
2-14	*263*	*0*	*-263*	*Stream filled*	*263*	*0*
2-15	*1,650*	*0*	*-1,650*	*Stream filled*	*1,650*	*0*
2-16	*3,750*	*0*	*-3,750*	*Stream filled*	*3,750*	*0*
2-17	*715*	*2,145*	*1,430*	*Stream width increased*	*0*	*1,430*
Culvert 2-17	–	–	–	*Culvert*	*60*	*0*
Culvert 2-17 (#2)	–	–	–	*Culvert*	*60*	*0*
2-17a	930	930	0	No change	0	0
Culvert 2-17A	–	–	–	*Culvert*	*45*	*0*
2-18	*2,400*	*1,800*	*-600*	*Stream width decreased*	*0*	*0*
Bridge 2-18	–	–	–	*Clear span*	*0*	*0*
2-19	2,250	2,250	0	No change	0	0
2-20	3,875	3,875	0	No change	0	0
Bridge 2-20	–	–	–	*Clear span*	*0*	*0*
2-21	550	550	0	No change	0	0
2-22	500	500	0	No change	0	0
2-23	200	200	0	No change	0	0
3-14	1,125	1,125	0	No change	0	0
4-3	625	625	0	No change	0	0
4-4	2,100	2,100	0	No change	0	0

4-5	150	150	0	No change	0	0
4-6	1,725	1,725	0	No change	0	0
N-15	*0*	*450*	*450*	*New stream creation*	*0*	*450*
Culvert N-15	–	*72*	*72*	*Culvert*	*0*	*0*
N-16	*0*	*180*	*180*	*New stream creation*	*0*	*180*
N-17	*0*	*240*	*240*	*New stream creation*	*0*	*240*
N-18	*0*	*400*	*400*	*New stream creation*	*0*	*400*
Culvert N-18	–	*20*	*20*	*Culvert*	*0*	*0*
N-19	*0*	*900*	*900*	*New stream creation*	*0*	*900*
N-20	*0*	*180*	*180*	*New stream creation*	*0*	*180*
Subtotal	**23,158**	**20,417**	**-2,741**		**6,178**	**3,780**

Tributary #4

Stream Segment	1997 Area (sq. ft.)	2003 Area (sq. ft.)	Difference	Cause	Impacts (sq. ft.)	Mitigation Credit
2-24	*1,850*	*1,030*	*-820*	*Stream filled*	*820*	*0*
3-15	375	375	0	No change	0	0
3-16	275	275	0	No change	0	0
Subtotal	**2,500**	**1,680**	**-820**		**820**	**0**

Tributary #5

Stream Segment	1997 Area (sq. ft.)	2003 Area (sq. ft.)	Difference	Cause	Impacts (sq. ft.)	Mitigation Credit
2-25	*1,300*	*0*	*-1,300*	*Stream filled*	*1,300*	*0*
2-26	*250*	*0*	*-250*	*Stream filled*	*250*	*0*
2-27	*2,600*	*0*	*-2,600*	*Stream filled*	*2,600*	*0*
2-28	2,000	2,000	0	No change	0	0
Culvert 2-28	–	–	–	*Culvert*	*384*	*0*
2-29	800	800	0	No change	0	0
2-30	1,800	1,800	0	No change	0	0

2-31	450	450	0	No change	0	0
N-25	*0*	*2,400*	*2,400*	*New stream creation*	*0*	*2,400*
Culvert N-25	–	*48*	*48*	*Culvert*	*0*	*0*
Rip Rap Spillway-1	*0*	*1,125*	*1,125*	*New spillway*	*0*	*1,125*
Rip Rap Spillway-2	*0*	*800*	*800*	*New spillway*	*0*	*800*
Rip Rap Spillway Culvert	–	*180*	*180*	*Culvert*	*0*	*0*
Subtotal	**9,200**	**9,603**	**403**		**4,534**	**4,325**

Tributary #6

Stream Segment	1997 Area (sq. ft.)	2003 Area (sq. ft.)	Difference	Cause	Impacts (sq. ft.)	Mitigation Credit
2-33	*3,750*	*0*	*-3,750*	*Stream filled*	*3,750*	*0*
2-34	*525*	*0*	*525*	*Stream filled*	*525*	*0*
2-35	*1,450*	*500*	*-950*	*Stream filled*	*950*	*0*
3-17	425	425	0	No change	0	0
3-18	300	300	0	No change	0	0
3-19	1,600	1,600	0	No change	0	0
3-20	*1,088*	*0*	*-1,088*	*Stream filled*	*1,088*	*0*
3-21	*4,875*	*4,480*	*-395*	*Stream filled*	*395*	*0*
4-7	375	375	0	No change	0	0
N-21	*0*	*2,160*	*2,160*	*New stream creation*	*0*	*2,160*
N-22	*0*	*2,700*	*2,700*	*New stream creation*	*0*	*2,700*
Bridge N-22	–	–	–	*Clear span*	*0*	*0*
N-23	*0*	*5,000*	*5,000*	*New stream creation*	*0*	*5,000*
N-24	*0*	*1,400*	*1,400*	*New stream creation*	*0*	*1,400*
Culvert N-24	–	*12*	*12*	*Culvert*	*0*	*0*
NW 5 Bridge	–	–	–	*Clear span*	*0*	*0*
Subtotal	**14,388**	**18,952**			**6,708**	**11,260**

Tributary #7

Stream Segment	1997 Area (sq. ft.)	2003 Area (sq. ft.)	Difference	Cause	Impacts (sq. ft.)	Mitigation Credit
2-36	375	375	0	No change	0	0
2-37	1,650	1,650	0	No change	0	0
2-38	300	300	0	No change	0	0
2-39	300	300	0	No change	0	0
Subtotal	**4,622.00**	**4,628.00**	**0**		**0**	**0**

Tributary #8

Stream Segment	1997 Area (sq. ft.)	2003 Area (sq. ft.)	Difference	Cause	Impacts (sq. ft.)	Mitigation Credit
2-40	300	300	0	No change	0	0
2-41	325	325	0	No change	0	0
2-42	480	480	0	No change	0	0
Subtotal	**1,105**	**1,105**	**0**		**0**	**0**

Drainage A

Stream Segment	1997 Area (sq. ft.)	2003 Area (sq. ft.)	Difference	Cause	Impacts (sq. ft.)	Mitigation Credit
1-1	2,250	2,250	0	No change	0	0
1-2	4,375	4,375	0	No change	0	0
1-3	1,063	1,063	0	No change	0	0
2-1	1,178	1,178	0	No change	0	0
2-2	1,155	1,155	0	No change	0	0
2-3	800	800	0	No change	0	0
Subtotal	**10,821**	**10,821**	**0**		**0**	**0**

Drainage B

Stream Segment	1997 Area (sq. ft.)	2003 Area (sq. ft.)	Difference	Cause	Impacts (sq. ft.)	Mitigation Credit
1-1	1,500	1,500	0	No change	0	0
2-1	350	350	0	No change	0	0
Subtotal	**1,850**	**1,850**	**0**		**0**	**0**

Drainage C

Stream Segment	1997 Area (sq. ft.)	2003 Area (sq. ft.)	Difference	Cause	Impacts (sq. ft.)	Mitigation Credit
1-1	*750*	*225*	*-525*	*Decreased width*	*0*	*0*
1-2	480	480	0	No change	0	0
1-3	*320*	*120*	*-200*	*Decreased width*	*0*	*0*
1-4	525	525	0	No change	0	0
1-5	400	400	0	No change	0	0
1-6	*450*	*0*	*-450*	*Stream filled*	*450*	*0*
Subtotal	**2,925**	**1,750**	**-1,175**		**450**	**0**

Drainage Ditches

Stream Segment	1997 Area (sq. ft.)	2003 Area (sq. ft.)	Difference	Cause	Impact (sq. ft.)	Mitigation Credit
DD-1	0	350	350		0	0
DD-2	0	200	200		0	0
Subtotal	**0**	**550**	**550**		**0**	**0**

Total Area of Stream Segments: West Branch of Llagas Creek and Major Tributaries

Location	1997 Area (sq. ft.)	2003 Area (sq. ft.)	Impacts (sq. ft.)	Mitigation Credit
West Branch Llagas Creek and Minor Tributaries	86,858	86,543	1,650	2,275
Tributary 1	21,063	20,698	8,699	9,460
Tributary 2	17,215	14,465	3,125	0
Tributary 3	23,158	20,417	6,118	3,780
Tributary 4	2,500	1,680	820	0
Tributary 5	9,200	9,603	4,726	4,325
Tributary 6	14,388	18,952	6,708	11,260
Tributary 7	2,625	2,625	0	0
Tributary 8	1,105	1,105	0	0
Subtotal West Branch (sq. ft.)	**91,254**	**176,088**	**31,846**	**31,100**
(acres)	**2.09**	**4.04**	**0.73**	**0.71**
Other Drainages				
Drainage A	10,821	10,821	0	0
Drainage B	1,850	1,850	0	0
Drainage C	2,925	1,750	450	0
Drainage Ditches	0	550	0	0
Subtotal Drainages (sq. ft.)	**15,596**	**14,971**	**450**	**0**
(acres)	**0.36**	**0.34**	**0.01**	**0.00**
TOTAL (sq. ft.)	**106,850**	**191,059**	**32,296**	**31,100**
(acres)	**2.45**	**4.39**	**0.74**	**0.71**

TABLE B: SEEP IMPACTS

Seep	Original Area	New Area	Difference	Comment	Impacts (sq. ft.)	Mitigation Credit
S1	1,500	1,500	0	0	0	0
S2	800	800	0	0	0	0
S3	*4,000*	*0*	*-4,000*	*Seep filled*	*4,000*	*0*
S4	1,225	1,225	0	0	0	0
S5	600	600	0	0	0	0
S6	200	200	0	0	0	0
S7	1,000	1,000	0	0	0	0
S8	4,900	4,900	0	0	0	0
S9	*2,400*	*0*	*-2400*	*Seep filled*	*2,400*	*0*
S10	*0*	*1,600*	*1,600*	*New seep*	*0*	*0*
S11	*0*	*4,030*	*4,030*	*New seep*	*0*	*0*
S12	*0*	*670*	*670*	*New seep*	*0*	*0*
S13	*0*	*1,885*	*1,885*	*New seep*	*0*	*0*
S14	*0*	*560*	*560*	*New seep*	*0*	*0*
S15	*0*	*810*	*810*	*New seep*	*0*	*0*
TOTAL (sq. ft.)	**16,625**	**19,780**			**6,400**	**0**
(acres)	**0**	**0.45**			**0.15**	**0**

TABLE C: STOCK POND IMPACTS

Pond	Original Area	New Area (Sq. ft.)	Difference	Comment	Impacts (sq. ft.)	Mitigation Credit
P1	9,800	9,800	0	0	0	0
P2	*4,000*	*2,700*	*-1,300*	*Decrease in pond dimensions*	*1,300*	*0*
P3	1,000	1,000	0	0	0	0
P4	1,500	1,500	0	0	0	0
P5	900	900	0	0	0	0
P6	675	675	0	0	0	0
P7	37,030	43,775	0	0	0	6,745
P8	3,500	3,500	0	0	0	0
P9	*1,800*	*0*	*-1,800*	*Pond filled*	*1,800*	*0*
P10	0	2975	0	0	0	0
TOTAL (sq. ft.)	**60,205**	**66,825**			**3,100**	**6,745**
(acres)	**1.38**	**1.53**			**0.07**	**0.15**

TABLE D: GOLF COURSE POND IMPACTS

Pond	Original Area	New Area (Sq. ft.)	Difference	Comment	Impacts (sq. ft.)	Mitigation Credit
Hole 8 Pond	0	43,920	43,920		0	0
Hole 18 Pond	0	15,540	15,540		0	0
Irrigation Pond	0	117,350	117,350		0	0
TOTAL (sq. ft.)	**0**	**176,810**			**0**	**0**
(acres)	**0**	**4.06**			**0**	**0**

TABLE E: WETLAND IMPACTS

Wetland	Original Area	New Area	Difference	Comment	Impacts (sq. ft.)	Mitigation Credit
W1	141,130	33,540	-107,590	Wetland boundary reduced	0	0
W2	2,610	2,610	0	No change	0	0
W3	18,730	11,140	0	No change	0	0
W4	13,070	13,710	0	No change	0	0
Mitigation Pond 3	*0*	*12,360*	*12,360*		*0*	*12,360*
NW 1	*0*	*7,510*	*7,510*	*New wetland*	*0*	*7,510*
NW 2	*0*	*13,180*	*13,180*	*New wetland*	*0*	*13,180*
NW 3	*0*	*11,140*	*11,140*	*New wetland*	*0*	*11,140*
NW 4	*0*	*3,780*	*3,780*	*New wetland*	*0*	*3,780*
NW 5	*0*	*46,000*	*46,000*	*New wetland*	*0*	*46,000*
NW 6	*0*	*4,340*	*4,340*	*New wetland*	*0*	*0*
NW 7	*0*	*10,100*	*10,100*	*New wetland*	*0*	*10,100*
NW 8	*0*	*1,980*	*1,980*	*New wetland*	*0*	*1,980*
TOTAL (sq. ft.)	**175,540**	**171,390**			**0**	**106,050**
(acres)	**4.03**	**3.93**			**0.00**	**2.43**

TABLE F: TOTAL IMPACTS

Type	1997 Area	2003 Area	Impacts	Mitigation Credit
Streams	193,708	191,059	32,296	31,100
Seeps	16,625	19,780	6,400	0
Stock Ponds	60,205	66,825	3,100	6,745
Golf Course Ponds	0	176,810	0	0
Wetlands	175,546	171,390	0	106,050
Drainage Ditch	0	550	0	0
Total Waters of the U.S. (sq. ft.)	**446,084**	**626,414**	**41,796**	**143,895**
(acres)	**10.24**	**14.38**	**0.96**	**3.30**

TABLE G: NON JURISDICTIONAL WATERS

Feature	Original Area	New Area
Detention Basin	0	41,700
Ornamental Ponds	0	1,054,690
TOTAL (sq. ft.)	**0**	**1,096,390**
TOTAL (acres)	**0**	**25.17**

THIRD ADDENDUM TO

ENVIRONMENTAL IMPACT REPORT

LION'S GATE RESERVE

(CordeValle)

LEAD AGENCY: COUNTY OF SANTA CLARA

File #4039-67-28-93
SCH #94043016

November 1998

TABLE OF CONTENTS*

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* The contents only include sections of the EIR that have been revised in this Addendum.

INTRODUCTION

Description of Project Modifications

This Third EIR Addendum has been prepared to address the changes to the Lion's Gate Reserve (CordeValle) project that have been proposed since the time that the EIR on the project was certified by the County Board of Supervisors in August 1996, and since the first EIR Addendum was prepared in January 1997 and the second EIR Addendum was prepared in June 1998.

The main changes to the project addressed in this EIR Addendum include the addition of two new project elements as follows: 1) construction of a winery/grape processing center on approximately 18 acres in the northwest portion of the site; 2) installation of a 400,000-gallon water storage tank (with maintenance access road and water pipeline) in the northeast portion of the site. These new project elements are described in detail below, followed by a summary evaluation of potential impacts resulting from these new facilities. The changes to the EIR resulting from these project elements are addressed in the body of this addendum.

New Winery Facility

The Lion's Gate project was approved by the County of Santa Clara subject to a condition that approximately 82.5 acres of the project's designated permanent open space area be planted in vineyards. In order to process the grapes from this on-site vineyard, the applicant proposes to construct a winery/grape processing center on approximately 18 acres in the northwest portion of the site, north of the golf course maintenance facility. Having the winery/processing center on-site would eliminate the need to truck grapes off-site for processing.

The land to be occupied by the winery has been removed from the permanent open space area of the Lion's Gate/CordeValle project and incorporated into the parcel containing the golf course and related facilities. (This aspect of the winery project was previously addressed in the Second Addendum to the EIR of June 1998).

The winery site is a located on gently sloping terrain covered in annual grasses and a few scattered oaks. The winery facilities would include a 25,000 square-foot production facility, which would be equipped for all phases of the wine-making process and would include administrative offices, meeting rooms, and a reception area. The winery's architectural image is planned to be of high quality and would complement the style of the larger project. Building materials would primarily consist of stucco walls and tile roofs, with some external elements clad in stone veneer. The facility would include a grape receiving area at the north end of the winery building and a truck dock at the south end for receiving barrels and shipping finished product. Twenty parking spaces would be provided for employees and visitors. A landscaped berm would be installed east of the winery building to screen the parking area from view of the nearby golf course.

The facility would include a 5,000 square-foot stand-alone structure for the storage and maintenance of mobile vineyard equipment. The equipment storage building would be located just north of the golf course maintenance facility and would not include fuel storage tanks. Fuel for the winery equipment would be obtained from the golf course maintenance facility.

Access to the winery would be exclusively from the controlled access maintenance road to Watsonville Road, and would include a 20-foot wide crushed gravel driveway extending north from the golf course maintenance facility.

The winery would be equipped for all phases of the wine-making process including crushing, fermentation, barrel aging, and bottling. The production capacity of the facility is estimated to be 45,000 cases per year, which is sufficient to process the grapes from approximately 100 acres of vineyards, and would be adequate to handle the annual grape harvest from the site. The winery would have approximately 8 full-time staff, with an additional 6 temporary workers employed each fall for the harvest and crush.

The winery would include a hospitality area that would be open to trade representatives and the public by invitation only. A small tasting room for the winery would also be included in the main golf course clubhouse complex and would be open to golf course guests only.

The traffic generated by the winery would include trips by employees and visitors, as well as about 40 truck trips to transport finished product (cases of wine) which would occur periodically throughout the year. In comparison, if all the grapes grown on-site had to be trucked to off-site processing centers, this would involve approximately 200 truck loads using 18-wheeled trucks.

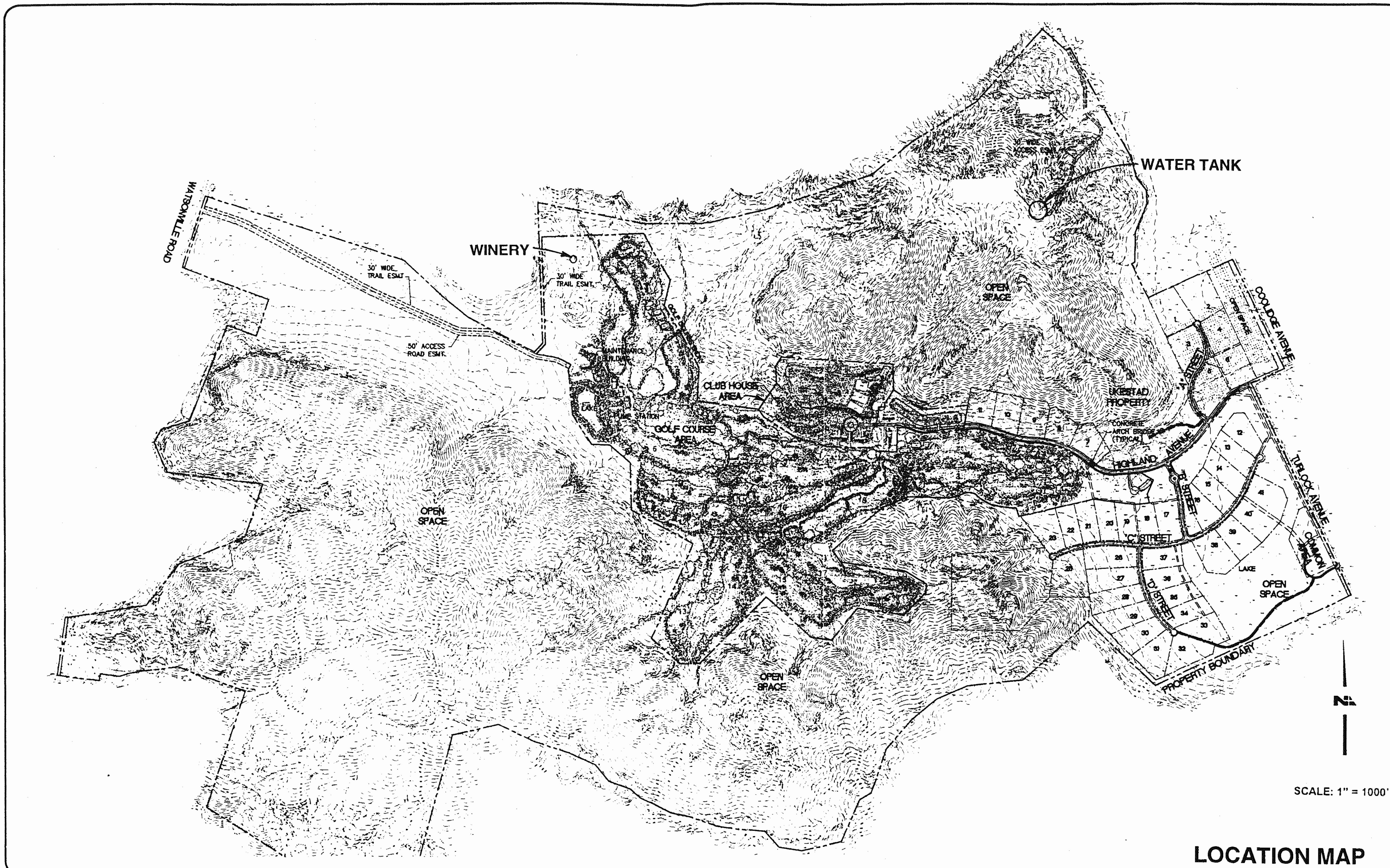
The winery would utilize approximately 700,000 gallons of non-potable water per year (which represents approximately 0.5 percent of total project water use). Most of this water would be used for irrigating the vineyard, although a small portion would be used for washing down the vats and equipment at the winery. This non-potable water would be obtained from the golf course irrigation reservoir located south of the golf course maintenance facility. Use of domestic water at the winery would be relatively minor and the water would be obtained from the water line serving the golf course maintenance facility.

Current plans are to treat domestic wastewater generated by the winery at a new septic tank and leachfield system south of the winery building. Alternatively, wastewater from the winery would be piped to the septic system at the maintenance facility. The siting and design of the septic tank and leachfield system would be subject to the criteria and standards of the Santa Clara County Department of Environmental Health.

Washdown water from cleaning the vats and equipment would be screened for solids and then piped to two small treatment ponds occupying a 0.5-acre area south of the winery building. This washdown water would include some residue from cleaning detergents and minor amounts of chemicals used in the wine making process. The treatment ponds would include aerators to prevent stagnation and odor generation, which would also prevent mosquito breeding. Some of the treated washwater would evaporate at the ponds and the remainder would be used for irrigation or frost protection in the vineyards. The organic material screened from the washwater would be applied on the vineyards or would be used in making mulch for soil amendment. The treatment ponds would include landscaped berms to the east and west to screen them from view of the golf course and winery access road, respectively. The design and installation of the wastewater treatment ponds would be subject to the approval of the Central Coast Regional Water Quality Control Board.

Various chemicals are used in the wine making process and detergents are used for cleaning the vats and equipment. None of these substances would be used in significant quantities and therefore would not require a hazardous materials permit. The used chemicals and cleaning detergents would be piped with the washwater to the on-site treatment ponds.

Grading for the winery facilities and access road would include cuts and fills of up to about 8 feet, and would involve approximately 11,300 cubic yards of cut and 14,800 cubic yards of fill. The 3,500 cubic yards of fill to be brought to the site would be obtained from surplus earthwork from other areas of the CordeValle project. Retaining walls would be required at several locations primarily to prevent tree removal along the winery access road and around the winery building. The height of the retaining walls would vary with the



Source: PACE Engineering

terrain and would be no higher than about 8 feet. No trees would be removed as a result of constructing the winery facility.

The access road and drainage facilities for the winery would be designed by a qualified civil engineer in accordance with County requirements and standards. Electric power and telephone service would be extended underground to the winery from the golf course maintenance facility. Fire hydrants would be provided in conformance with the requirements of the County Fire Marshal's Office.

Water Storage Tank

A new 400,000-gallon domestic water storage tank for the West San Martin Water Works is planned for the upper elevations in the northeast portion of the site. This tank is needed to provide adequate water pressure and fire flows to the Lion's Gate project, and would also improve fire flows for existing residences east of the project site.

The maintenance access road to the tank would commence from the western extension of San Martin Avenue and would follow an existing dirt track up the hillside to the tank site. The new water main from the tank would be installed in the tank access road to the toe of the eastern hillside where it would split into two mains heading north and south. The southern main would follow the base of the hill to the residential portion of the CordeValle project located north of Highland Avenue. The northern main would follow the maintenance access road to San Martin Avenue where it would tie into an existing water line.

The water tank site is located on an broad eastward sloping swale just below the ridgeline. The tank would be 70 feet in diameter and 34 feet high, with approximately one-half of the overall tank height located below adjacent native ground level. The tank walls would be reinforced concrete supported on a spread foundation, and the tank would have an aluminum domed roof which would be rigidly connected to the tank walls.

Cuts of up to 23 feet would be required to achieve a level pad for the tank. The tank foundation would bear entirely on cut. A french drain would be installed outside the perimeter of the tank to control subsurface drainage.

The tank site takes advantage of existing trees to provide visual screening from the valley floor to the east. Additional trees would be planted as needed to increase visual screening. No trees would be removed for the tank, access road, or water mains.

Summary Evaluation of Potential Impacts Resulting from Winery and Water Tank

The proposed winery and water tank would not result in any new significant environmental impacts compared with the project evaluated in the EIR. The environmental effects of the new project elements are briefly evaluated below.

Land Use: The winery and water tank represent a very minor addition in square footage of the project, and would not significantly increase the land use intensity of what is already a very low density development. The winery and water tank sites are not adjacent to existing off-site development, and as discussed under 'Aesthetics' below, would be visible only in the distance from a few existing residences. Since the winery and water tank would not result in significant land use impacts, no changes are required to EIR Section *III. A. Land Use.*

Agriculture: The winery would provide a facility for processing grapes from the vineyards that were stipulated as a mitigation for loss of prime farmland in the EIR. The EIR Section *III. B. Agriculture* has been amended to include mention of the winery's role in processing the grapes produced on-site.

Parks, Recreation and Open Space: As discussed in the second EIR Addendum of June 1998, the removal of the winery site from the project's permanent open space area would result in a very small reduction of the open space area. However, the total open space allocation of the project still exceeds the 1,226 acres required to fulfill the 90 percent open space requirement for the Hillside cluster subdivision. The winery site is located in close proximity to the on-site segment of the San Martin Cross-Valley Trail which will run along the northern project boundary. The winery site has been designed to leave a strip of permanent open space between the winery site and northern and western site boundary that is of ample width to accommodate the 30-foot wide cross-site trail easement. The water tank would have no impact on the cross-site trail or any other open space amenity. The water tank and related facilities are also located well away from the cross-site trail easement and would not have a significant impact on recreation and open space. No changes are required to EIR Section *III. C. Parks, Recreation and Open Space.*

Geology and Soils: The sites of the winery and water tank were evaluated for geologic constraints by Twining Laboratories in October 1998. The study found that there are no earthquake faults or bedrock fault contacts in the vicinity of either the winery or the water tank sites. Likewise, there are no landslides in the vicinity of the winery or water tank, and the native slopes in the vicinity of both facilities appear relatively stable. Neither site is susceptible to liquefaction or seismic settlement, and both sites are located well away from the mapped area of serpentine bedrock located elsewhere on the Lion's Gate site. The near-surface soils at both the winery and water tank sites have medium potential for soils expansion. This would not pose a problem at the water tank site since the tank site will be subexcavated well below the surface soil. At the winery site, mitigation for expansive soils would consist of overexcavation for footings and floor slabs. Shallow groundwater is present at the water tank site, which would be mitigated by the installation of proper surface and subsurface drainage facilities. The winery site does not appear to be subject to high groundwater. The EIR Section *III. D. Geology and Soils* has been amended to incorporate the pertinent findings of the Twining report, insofar as these issues have not already been covered in the EIR. The Twining report is included in Appendix C of this EIR Addendum.

Hydrology and Drainage: No part of either the winery or water tank sites are located within or across existing drainage courses. The winery site is located west of an intermittent drainage courses in the northwestern portion of the project. Proper drainage facilities for the winery site will be designed by a civil engineer in accordance with County requirements. The water tank is located at the head of a swale just below a broad ridgeline. The tank site has a tributary drainage area of only 3.0 acres, so minimal storm flow will pass through the tank vicinity. The tank site will be designed to convey surface and subsurface drainage around the tank to the swale below. Neither the winery nor water tank would result in significant increases in site runoff or alteration of site drainage patterns. No changes are required to the EIR Section *III. E. Hydrology and Drainage.*

Water Quality: The water tank and winery facilities would result in relatively small areas of additional paved surfaces where non-point pollutants could accumulate and wash off to the adjacent watershed. These effects are adequately covered in the existing EIR Section *III. E. Water Quality.* (See 'Wastewater Treatment and Disposal' below for discussion of treatment and disposal of domestic wastewater and washdown water.)

Biological Resources: The proposed winery and water tank elements (including the tank access road and pipeline alignments) have been evaluated by H.T. Harvey and Associates. The biologists surveyed the sites and found no sensitive species or habitats that would be affected by these new project elements. No trees would be removed as a result of either of these new project elements. Therefore, the winery and water tank would result in no new potential impacts to biological resources. No changes are required to EIR Section *III. F. Biological Resources*. The letter report prepared by Harvey and Associates which addresses these new project elements is contained in Appendix F of this EIR Addendum.

Archaeology: The winery and water tank facilities (including the tank access road and pipeline alignment) are not within areas of archaeological sensitivity and there are no known archaeological resources in the vicinity of these sites. Therefore, the winery and water tank would result in no new potential impacts to archaeological resources. No changes are required to the EIR Section *III. E. Archaeology*. A letter report on these project elements prepared by Basin Research Associates is contained in Appendix G of this EIR Addendum.

Aesthetics: The winery site is located in the northwest corner of the project site where it is all but invisible from public vantage points. The winery would only be visible from a single residence on the off-site ridge to the north, at a distance of at least 2,000 feet. The winery would be designed to conform to the architectural style of the CordeValle clubhouse complex, and no trees would be removed for the winery. The water tank would be installed at a relative high elevation; however, the visibility of the tank would be minimized by its location in a broad swale just below the ridgeline. Approximately one-half of the tank would be buried so only the upper portion of the tank would extend above ground elevation. The tank site takes advantage of existing trees to provide visual screening from the valley floor. Additional trees would be planted as needed to increase visual screening. The tank may be partially visible in the distance from the valley floor to the east and also from some residences in the Hayes Valley Ranch to the north and west, which would be at least 2,000 feet away. Thus neither the winery nor the water tank would result in significant visual impacts. The EIR Section *III. J. Visual and Aesthetics* has been modified to include discussions of the winery and water tank.

Traffic: The traffic generated by the winery would include trips by employees and visitors, as well as about 40 truck trips to transport finished product (cases of wine), which would occur periodically throughout the year. There would also be occasional trips by delivery vehicles. This level of trip generation would not have a significant effect on traffic operations along Watsonville Road. The EIR Section *III. K. Traffic and Circulation* has been amended to include a discussion of traffic generated by the winery.

Noise: Neither the winery nor the water tank would result in significant new operational noise sources. The winery operation would be conducted entirely indoors, including the crushing of grapes during the harvest season. There would be occasional noise generated by trucks traveling to the winery, but this noise would not be audible from off-site locations. The operation of the water tank likewise would not generate noise audible from off-site locations, and truck traffic from maintenance vehicles visiting the tank would be infrequent. Therefore, no changes would be made to the EIR Section *III. L. Noise* with respect to operational noise.

The construction noise generated during installation of the winery and the water tank would be noticeable but not significant at the nearest residences which are located at least 1,000 feet away in both cases. Construction of the portion of the tank access road along the base of the hillside may temporarily elevate noise levels at the nearest residences to the east along the western extension of San Martin Avenue. These residences would also be subject to temporary noise from truck traffic generated during the construction of the water tank. This may result in a short-term noise impact at these residences, although the impact would be mitigated by measures contained in the EIR. The EIR Section *III. L. Noise* has been amended to include a discussion of this potential construction noise impact.

Air Quality: The slight increase in traffic resulting from the addition of the winery facility would cause a very small increase in the generation of vehicle emissions. However, according to air quality consultant M'OC Physics Applied, this increase would not be significant in terms of either local carbon monoxide concentrations or in term of pollutants of regional concern. No changes are required to EIR Section *III. M. Air Quality*. The winery operation would not result in the creation of noxious odors. The grape crushing would occur entirely within the winery building, and the fermentation process would occur in fully enclosed vats. At close range the winery would exude the pleasant smell of oak and fruit. However, at the nearest residence located at least 1,000 feet north no winery odors would be detectable.

Hazards: Various chemicals would be used in the wine making process and detergents would be used for cleaning of the vats and equipment. In addition, small amounts of oils and lubricants would be used by the vineyard tractors and equipment (fuel would be obtained from the nearby golf course maintenance facility). These chemicals or hydrocarbons would not be used in significant quantities and therefore would not require a hazardous materials permit. No changes to the EIR Section *III. N. Hazardous Materials, Public Health and Safety* are required.

Water Supply: The winery would use approximately 210 gallons of domestic water daily for the maximum of 14 staff who would be on-site during the harvest and crush. In addition, a daily average of approximately 2,000 gallons of non-potable water would be used for washing down the vats and equipment. This additional water consumption represents less than 0.5 percent of the total water consumption estimate for the CordeValle project and would be readily accommodated by the surplus water supply available to the project as calculated in the EIR. The EIR Section *III. P. Water Supply* has been amended to include the additional water demand for the winery.

Wastewater Treatment and Disposal: Current plans are to treat domestic wastewater generated at the winery at a new septic tank and leachfield system to be located south of the winery building. However, wet weather percolation tests have not yet been conducted to determine whether on-site soils are suitable for leachfields. Alternatively, wastewater from the winery would be piped to the septic system at the nearby golf course maintenance facility. The siting and design of the septic tank and leachfield system would be subject to the criteria and standards of the Santa Clara County Department of Environmental Health.

Washdown water from cleaning the vats and equipment would be screened for solids and then piped to two small treatment ponds occupying a 0.5-acre area south of the winery building. The treatment ponds would include aerators to prevent stagnation and odor generation, which would also prevent mosquito breeding. Some of the treated washwater would evaporate at the ponds, and the remainder would be used for irrigation or frost protection in the vineyards. The organic material screened from the washwater would be applied to the vineyards or used in making mulch for soil amendment. The design and installation of the wastewater treatment ponds would be subject to the approval of the Central Coast Regional Water Quality Control Board. The EIR Section *III. Q. Wastewater Treatment and Disposal* has been amended to include a discussion of wastewater treatment and disposal for the winery.

Rationale for Preparation of an EIR Addendum

This document has been prepared in accordance with the requirements of the California Environmental Quality Act (CEQA) which sets forth specific requirements for the documentation of potential environmental impacts which may result from modifications made to a proposed project after an EIR on the project has been certified. Under these circumstances, Sections 15162 through 15164 of the CEQA Guidelines provide for the preparation of one of three types of documents depending on the situation. The criteria to be met for each type of document are as follows: 1) a 'Subsequent EIR' shall be prepared if the changes to the project are substantial, and will result in major revisions to the EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; 2) a 'Supplement to an EIR' shall be prepared if the conditions described in #1 above apply but only minor changes or revisions to the EIR are necessary; and 3) an 'Addendum to an EIR' shall be prepared if some minor changes and additions are necessary, but the conditions which would necessitate the preparation of a Supplement to an EIR are not present. In the present case, the proposed modifications may or may not be considered substantial, but in no instance would new significant environmental effects be involved or the severity of a significant effect be increased substantially, as discussed above and in the body of this document. In addition, the changes to the EIR required to address the proposed project modifications are minor in nature. Thus two of the required criteria for preparing a Subsequent EIR and one of the required criteria for preparing a Supplement to an EIR would not apply. Therefore, according to CEQA criteria noted above, the type of environmental document that should be prepared in this instance is an 'Addendum to an EIR'.

Organization of This Document

Since this is the Third Addendum to the EIR, this document identifies revisions to the certified EIR, as modified by the First and Second Addendums, which reflect the changes in project description and environmental analysis resulting from the proposed modifications to the project. In order to facilitate the reader's comprehension without having to refer back to the certified EIR and the previous Addendums, this document contains the affected portion of the EIR to provide a context for the text changes. Revisions to the text are indicated by ~~strikethrough~~ for deletions and <u>underline</u> for additions.

I. PROJECT DESCRIPTION

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B. DESCRIPTION OF THE PROPOSED PROJECT

Overview

1. ~~A~~ Use Permit applications for a public access championship golf course, including a clubhouse with restaurant, 45 units of overnight accommodations, a practice range, a maintenance facility, ~~and~~ a swim and tennis center, a winery/grape processing center, and a water storage tank.

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Winery/Grape Processing Center

In order to process the grapes from the on-site vineyards, the applicant proposes to construct a winery/grape processing center in the northwest portion of the site, north of the golf course maintenance facility. Having the winery/processing center on-site would eliminate the need to truck grapes off-site for processing.

The winery site comprises approximately 18 acres of gently sloping terrain covered in annual grasses and a few scattered oaks (see Figures 9a, 10e and 10f). The winery facilities would include a 25,000 square-foot production facility, which would be equipped for all phases of wine making and would include administrative offices, meeting rooms, and a reception area. The winery's architectural image is planned to be of high quality and would complement the style of the larger project. Building materials would primarily consist of stucco walls and tile roofs, with some external elements clad in stone veneer. The facility would include a grape receiving area at the north end of the winery building and a truck dock at the south end for receiving barrels and shipping finished product. Twenty parking spaces would be provided for employees and visitors. A landscaped berm would be installed east of the winery building to screen the parking area from view of the nearby golf course.

The facility would include a 5,000 square-foot stand-alone structure for the storage and maintenance of mobile vineyard equipment. The equipment storage building would be located just north of the golf course maintenance facility and would not include fuel storage tanks. Fuel for the equipment would be obtained from the golf course maintenance facility.

Access to the winery would be exclusively from the controlled access maintenance road to Watsonville Road, and would include a 20-foot wide crushed gravel driveway extending north from the golf course maintenance facility.

The winery would be equipped for all phases of the wine-making process including crushing, fermentation, barrel aging, and bottling. The production capacity of the facility is estimated to be 45,000 cases per year, which is sufficient to process the grapes from approximately 100 acres of vineyards, and would be adequate to handle the annual grape harvest from the site. The winery would have approximately 8 full-time staff, with an additional 6 temporary workers employed each fall for the harvest and crush.

The winery would include a hospitality area that would be open to trade representatives and the public by invitation only. A small tasting room for the winery would also be included in the main golf course clubhouse complex and would be open to golf course guests only.

The traffic generated by the winery would include trips by employees and visitors, as well as about 40 truck trips (with standard 2-axle 20-foot trucks) to transport finished product (cases of wine) which would occur periodically throughout the year. In comparison, if all the grapes grown on-site had to be trucked to off-site processing centers, this would involve approximately 200 truck loads using 18-wheeled trucks.

The winery would utilize approximately 700,000 gallons of non-potable water per year (which represents approximately 0.5 percent of total project water use). Most of this water would be used for irrigating the vineyard, although a small portion would be used for washing down the vats and equipment at the winery. This non-potable water would be obtained from the golf course irrigation reservoir located south of the golf course maintenance facility. Use of domestic water at the winery would relatively minor and the water would be obtained from the water line serving the golf course maintenance facility.

Current plans are to treat domestic wastewater generated by the winery at a new septic tank and leachfield system south of the winery building. Alternatively, wastewater from the winery would be piped to the septic system at the maintenance facility. The siting and design of the septic tank and leachfield system would be subject to the criteria and standards of the Santa Clara County Department of Environmental Health.

Washdown water from cleaning the vats and equipment would be screened for solids and then piped to two small treatment ponds occupying a 0.5-acre area south of the winery building. This washdown water would include some residue from cleaning detergents and minor amounts of chemicals used in the wine making process. The treatment ponds would include aerators to prevent stagnation and odor generation, which would also prevent mosquito breeding. Some of the treated washwater would evaporate at the ponds and the remainder would be used for irrigation or frost protection in the vineyards. The organic material screened from the washwater would be applied on the vineyards or would be used in making mulch for soil amendment. The treatment ponds would include landscaped berms to the east and west to screen them from view of the golf course and winery access road, respectively. The design and installation of the wastewater treatment ponds would be subject to the approval of the Central Coast Regional Water Quality Control Board.

Various chemicals are used in the wine making process and detergents are used for cleaning the vats and equipment. None of these substances would be used in significant quantities and therefore would not require a hazardous materials permit. The used chemicals and cleaning detergents would be piped with the washwater to the on-site treatment ponds.

Grading for the winery facilities and access road would include cuts and fills of up to about 8 feet, and would involve approximately 11,300 cubic yards of cut and 14,800 cubic yards of fill. The 3,500 cubic yards of fill to be brought to the site would be obtained from surplus earthwork from other areas of the CordeValle project. Retaining walls would be required at several locations primarily to prevent tree removal along the winery access road and around the winery building. The height of the retaining walls would vary with the terrain and would be no higher than about 8 feet. No trees would be removed as a result of constructing the winery facility.

The access road and drainage facilities for the winery would be designed by a qualified civil engineer in accordance with County requirements and standards. Electric power and telephone service would be extended underground to the winery from the golf course maintenance facility. Fire hydrants would be provided in conformance with the requirements of the County Fire Marshal's Office.

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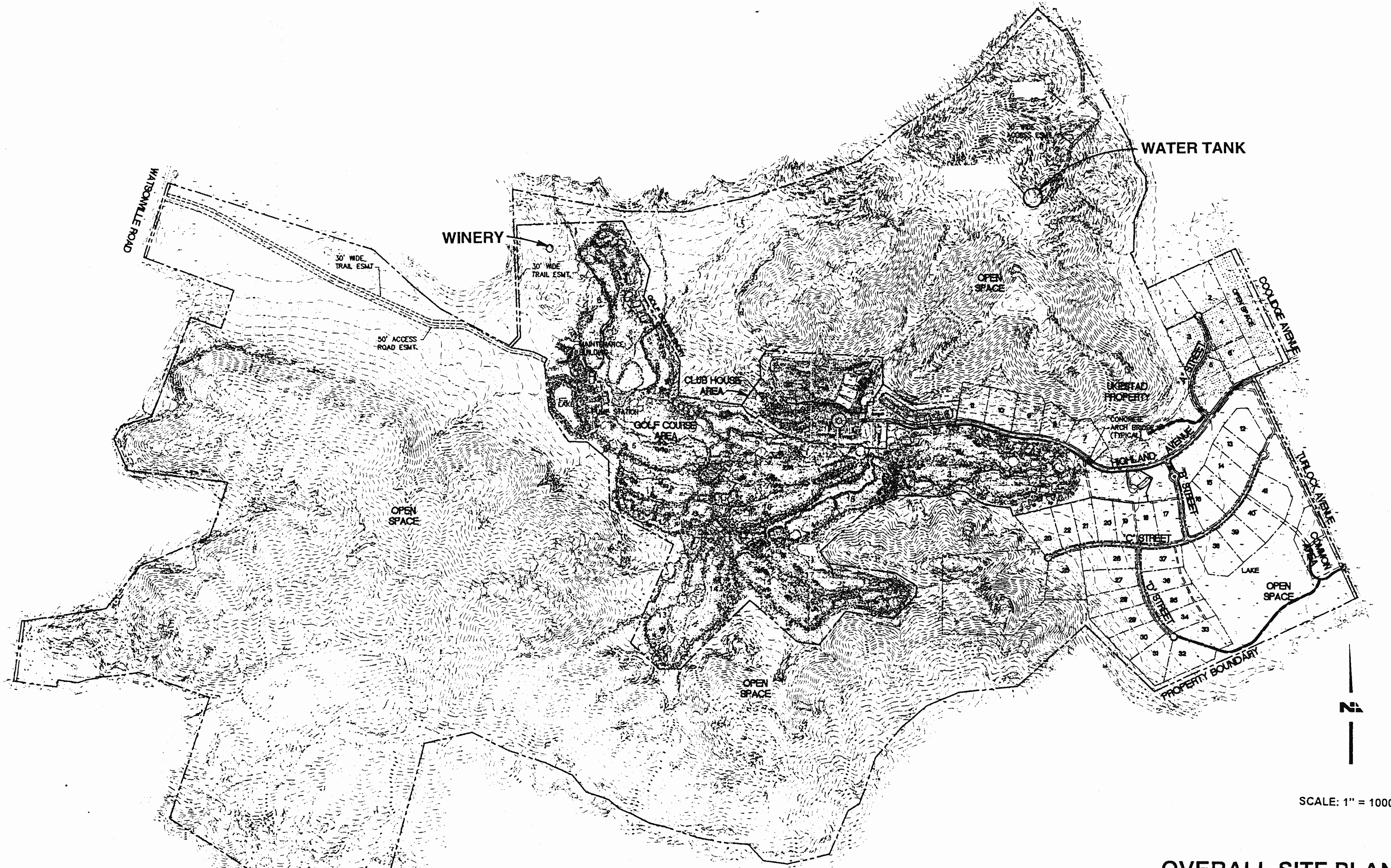
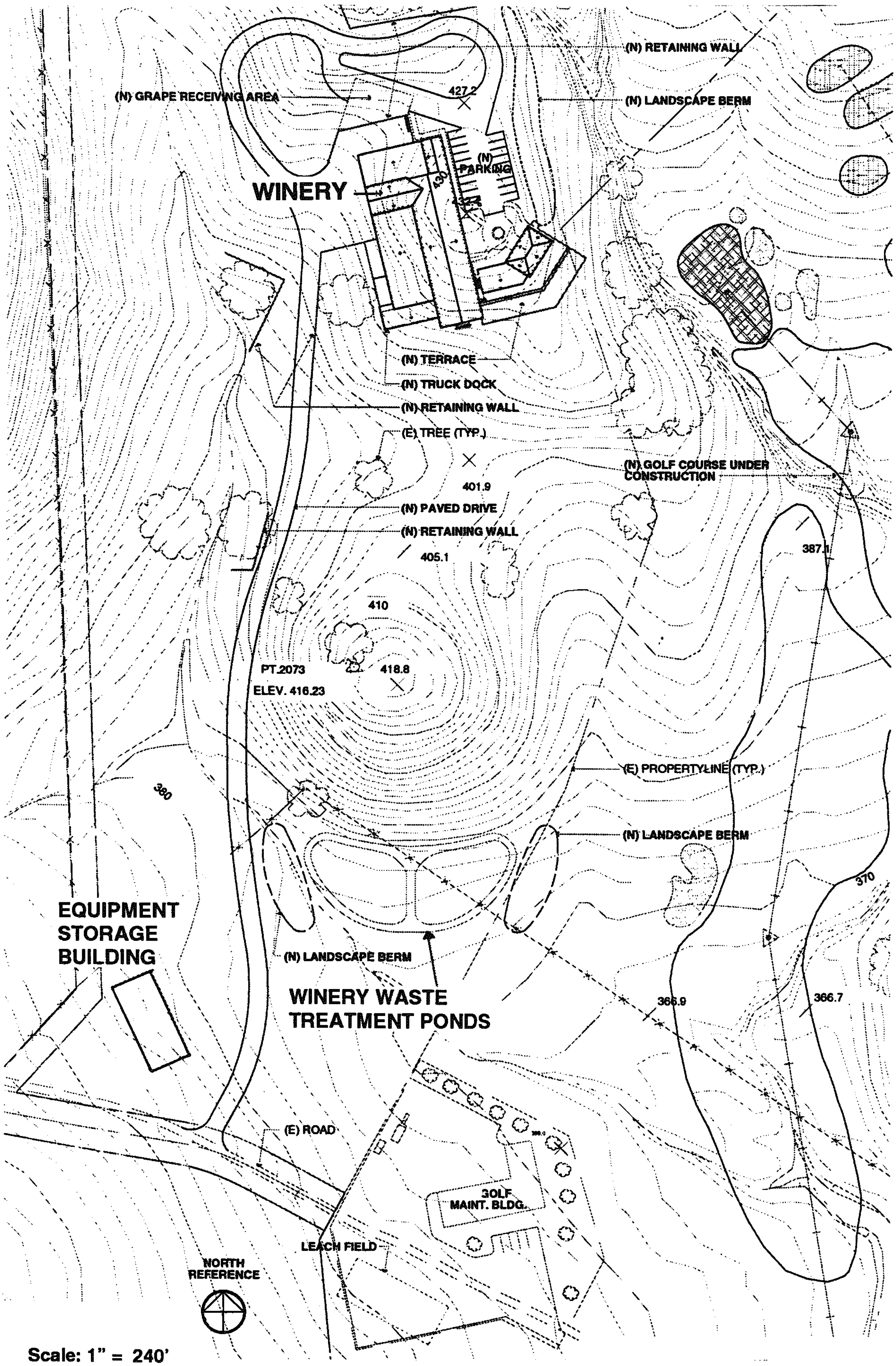


OVERALL SITE PLAN

Source: PACE Engineering

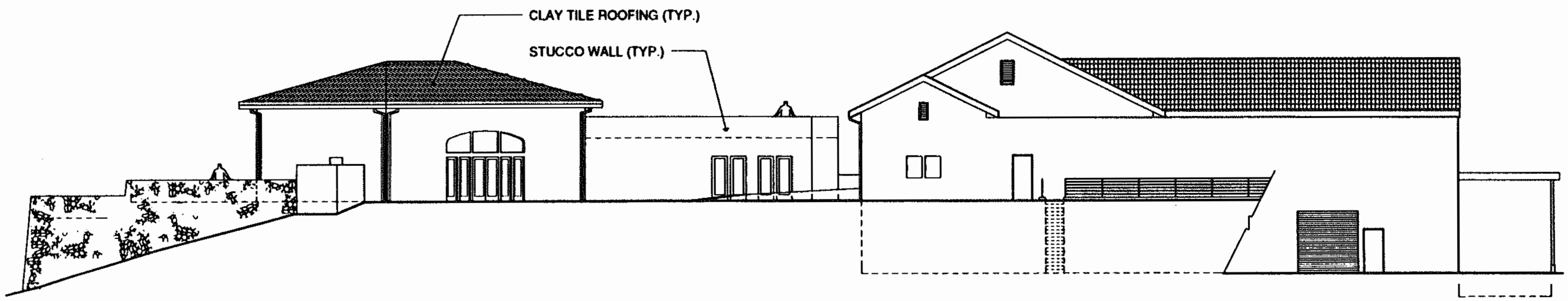
FIGURE 9a



WINERY SITE PLAN

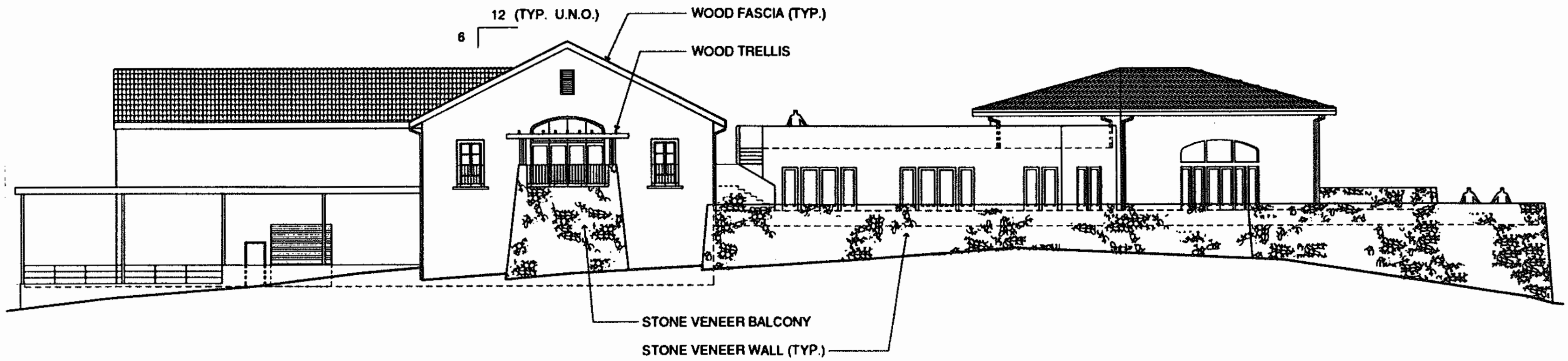
Source: Hall & Bartley Architects

FIGURE 10e



NORTH ELEVATION

1" = 30'-0"



SOUTH ELEVATION

1" = 30'-0"

WINERY ELEVATIONS

Source: Hall & Bartley Architects

FIGURE 10f

Associated Improvements and Programs

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Water Storage Tank

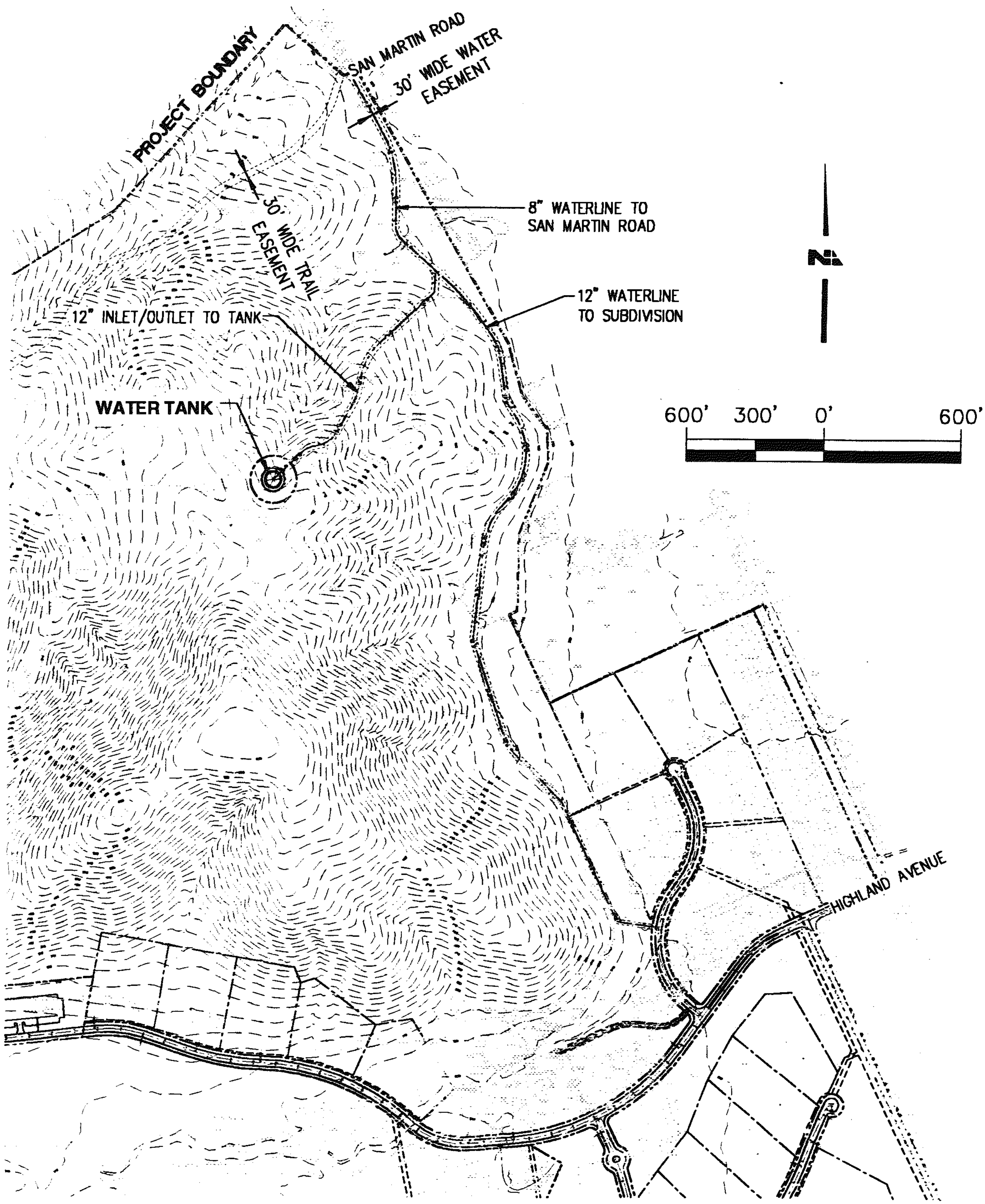
A new 400,000-gallon domestic water tank for the West San Martin Water Works is planned for the upper elevations in the northeast portion of the site (see Figures 9a, 10g and 10h). This tank is needed to provide adequate water pressure and fire flows to the Lion's Gate project, and would also improve fire flows for existing residences east of the project site.

The maintenance access road to the tank would commence from the western extension of San Martin Avenue and would follow an existing dirt track up the hillside to the tank site. The new water main from the tank would be installed in the tank access road to the toe of the eastern hillside where it would split into two mains heading north and south. The southern main would follow the base of the hill to the residential portion of the CordeValle project located north of Highland Avenue. The northern main would follow the maintenance access road to San Martin Avenue where it would tie into an existing water line.

The water tank site is located on an broad eastward sloping swale just below the ridgeline. The tank would be 70 feet in diameter and 34 feet high, with approximately one-half of the overall tank height located below adjacent native ground level. The tank walls would be reinforced concrete supported on a spread foundation, and the tank would have an aluminum domed roof which would be rigidly connected to the tank walls.

Cuts of up to 23 feet would be required to achieve a level pad for the tank. The tank foundation would bear entirely on cut. A french drain would be installed outside the perimeter of the tank to control subsurface drainage.

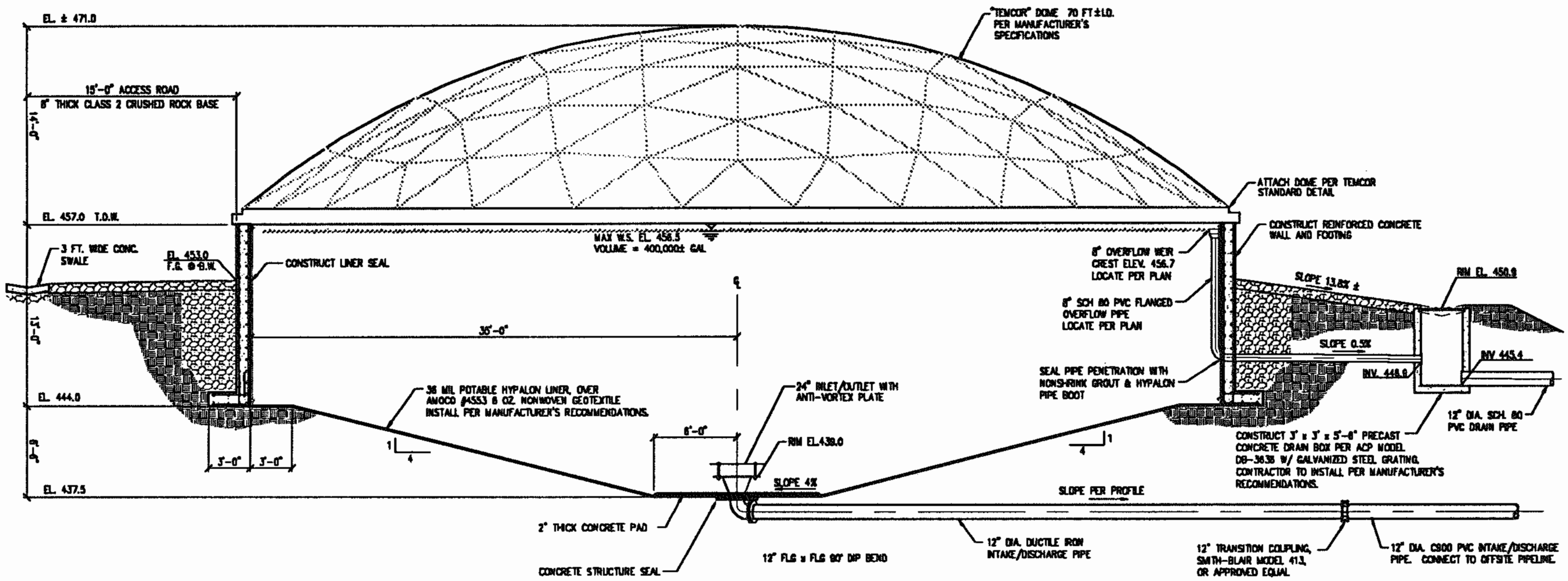
The tank site takes advantage of existing trees to provide visual screening from the valley floor to the east. Additional trees would be planted as needed to increase visual screening. No trees would be removed for the tank, access road, or water main.



WATER TANK AND PIPELINE

Source: PACE Engineering

FIGURE 10g



WATER TANK CROSS SECTION

Source: PACE Engineering

FIGURE 10h

III. ENVIRONMENTAL SETTING, IMPACTS AND MITIGATION MEASURES

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B. AGRICULTURE

Impacts and Mitigation

Mitigation 1. **The loss of approximately 110 acres of prime farmland would be offset by the planting of vineyards in areas not proposed for development.**

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The grapes produced in the on-site vineyards would be processed at the winery planned for the northwest portion of the site. The capability to process the grapes on-site would eliminate the estimated 200 truckloads (by 18-wheel trucks) that would otherwise need to be transported to off-site processing facilities.

D. GEOLOGY AND SOILS

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(Note: A general geotechnical report on the winery and water storage tank is contained in Appendix C of this Addendum. A detailed geotechnical report on the water tank is also contained in Appendix C. A detailed geotechnical report on the winery will be prepared prior to construction.)

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Impacts and Mitigation

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Impact 5. **The presence of unstable slopes and existing landslide deposits on the project site may pose a hazard to proposed structures, and may be affected by project grading. (Potential Significant Impact)**

Landslides on the proposed development site were mapped by others (Kaldveer Associates, 1989, and Wahler Associates, 1990). The locations of these landslides are shown on Figure No. 2 of the report entitled "Geologic Input of the Lion's Gate Property" (DEIR Volume II) which is a compilation of site data generated prior to April 1993.

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With respect to the water storage tank and winery project elements, previously mapped landslides were observed during the geologic reconnaissance near the two sites conducted by Twining Laboratories in May and July 1998. These slides were appeared to comprise relatively shallow rotational block slides and slumps. The previous mapping studies by others did not indicate landslides have occurred in the immediate vicinity of the water storage tank or winery buildings sites. Field reconnaissance performed by Twining did not indicate the occurrence of notable landslides near the subject sites. Native slopes in the areas proposed for the water storage tank and winery buildings appear relatively stable.

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Impact 7. **Expansive soils present on the site may cause movement or heaving, potentially resulting in damage to foundations, concrete pads and pavements. (Potential Significant Impact)**

The majority of the near-surface soil on the site consists of silty or sandy clay, which is moderately to highly expansive. The higher clay content gives the soil the capacity to absorb and release large amounts of moisture with associated volume changes. During the rainy season these soils swell as water is absorbed, and during the dry season they shrink as water is removed by evapotranspiration. Highly expansive soils are evident during the dry season by the formation of open shrinkage cracks on the ground surface.

The expansion (or swell) of soils could exert pressures against foundation elements, and on slopes that could result in creep of the soils. The shrinking of soils could result in consolidation beneath the foundation elements. Structures built on foundations that are not designed for such soil movements can be deformed and damaged.

The north-central area of the site contains colluvial materials which are potentially highly expansive. Any development proposed for this area, such as the maintenance facility, the water storage tank, and the winery/grape processing center, would require special attention during design and construction of building foundations and pavements, but would probably not require site plan modifications.

Mitigation 7. The potential damage to foundations and pavements would be avoided by following the requirements of the Uniform Building Code, and may necessitate removal of the expansive soils from areas where buildings, slabs-on-grade or pavements are planned to be constructed.

Site-specific geotechnical studies would be conducted prior to permit approvals to determine if expansive soils are present within the proposed development areas. To mitigate potential foundation problems associated with expansivity of soils, the project geotechnical engineer may recommend that all foundations bear on low expansivity subsoils or bedrock, necessitating the removal of any expansive soils from those areas.. This would result in reduced foundation requirements and lower foundation costs. If removal of expansive soils is not possible, the foundations should be designed to accommodate movements caused by the expansive soils.

At the water tank site, the tank pad would be cut to a depth of about 23 feet, which would remove the majority of the expansive surface soils. Any remaining expansive soils would be removed and replaced with engineered fill as appropriate.

Any locations where ~~the~~ internal access roads traverses expansive soils would require stripping of the expansive soil in the foundation subgrade.

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Impact 10. **Shallow groundwater conditions in areas of the site may adversely affect below-ground structures and utilities. (Potential Significant Impact)**

The relatively shallow groundwater conditions are expected to affect below-ground structures including basements and utilities located at depths of greater than 10 feet below original ground surface in spring areas and in the valley floor. Excavation for stormwater retention basins or ponds, requiring cuts greater than a depth of 10 feet, may encounter groundwater.

Since the water storage tank site is near the top of a broad swale, it is expected that some shallow groundwater may occur near the tank pad elevation. However, the amount of groundwater is anticipated to be relatively small and the potential pore pressure would not be great.

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Mitigation 10. **Groundwater problems would be minimized by avoiding subsurface construction during or just after the rainy season, and through implementation of grading and drainage measures to improve surface and subsurface drainage.**

The grading and drainage plan would include provisions for improving surface and subsurface drainage to alleviate the seasonal groundwater problem.

At the water storage tank site, shallow groundwater conditions would be adequately addressed by installing a french drain on the outside of the tank wall foundation.

J. VISUAL AND AESTHETICS

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Impacts and Mitigation

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Impact 1. **The project would result in visual changes to some areas of the site open to public view. (Potential Significant Impact)**

As discussed under 'Environmental Setting' above, the most visually accessible areas of the site are located along Coolidge Avenue (Santa Teresa Boulevard) and Turlock Avenue at the eastern end of the site, and along Watsonville Road to the west. The interior valley area of the site is not visible from off-site vantage points except for the single home that overlooks the site from the northern ridge. The hillside areas nearest to the flanking roadways are also visible.

The residential subdivisions proposed for the eastern end of the site would be partially visible from adjacent land uses and roadways. In the Rural Residential subdivision proposed adjacent to Coolidge Avenue, north of Highland, the 6 proposed lots would be set back from the roadway at least 300 feet toward the adjacent hillside to the west. The setback area would remain as permanent open space, with a landscaped berm providing visual screening for these lots. A stormwater detention basin would occupy the open space area between the roadside berm and the residential lots; however, the basin would be entirely screened from the roadway by the intervening landscaped berm.

The residential cluster subdivision proposed for the field west of Turlock Avenue would also be partially visible to passing motorists. However, this subdivision would be set back 200 feet to 1,400 feet from the roadway, and would be screened by the landscaped berms planted with black walnut trees. Nevertheless, the roof lines of the nearest dwellings would be visible from Turlock Avenue and Santa Teresa Boulevard, at least until the black walnuts have matured enough to provide more complete screening (see Figure 16). Since two of the proposed lots (Lots 24 and 25) extend into the adjacent hillside area, it is possible that future custom homes to be built on these lots may be visible from Turlock Avenue and Santa Teresa Boulevard.

The water storage tank planned for the northeastern hillside area of the site may be partially visible in the distance from the valley floor to the east and from two or three residences in the Hayes Valley Ranch project to the north and west. The visibility of the tank would be minimized by its location in a broad swale just below the ridgeline. Approximately one-half of the tank would be buried so only the upper portion would extend above ground elevation. The tank site also takes advantage of existing trees downslope to the east for visual screening, and additional trees would be planted as needed to increase visual screening. The walls of the tank will be constructed of reinforced concrete and the aluminum dome roof will have a flat or dull finish. These materials and finishes will not result in reflection or glare.

The small horse stable planned for the northwest corner of the site would be sited in a small side valley along the toe of the eastern hillsides. The nearest existing land uses include a nursery business located approximately 500 feet east and two single-family dwellings located approximately 800 feet to the northeast and the southeast. The existing nursery with its dense boundary landscaping almost completely screens the stable from view of Coolidge Avenue and the residences in the vicinity.

The package wastewater treatment plant and residential lake occupy the area between the roadside berm and the residential subdivision. However, these project components would be low in profile and almost completely shielded from view by the landscaped berm along Turlock Avenue.

The only other visual changes that would occur at the eastern end of the site would be the roadway improvements and entry features along the Highland Avenue entry way. However, any improvements would be subject to Architecture and Site Approval to ensure that signs, fences, lighting and other features would be compatible with their surroundings. Also, the existing mature landscaping trees around the ranch complex would be retained and incorporated into the project.

From Watsonville Road to the west, very little of the project, if anything, would be visible. All of the area with ¾ mile of the roadway is proposed to be maintained as permanent open space. The golf course would be located to the east of the low saddle that crosses the western portion of the valley, and thus would not be visible from Watsonville Road. It is possible that the maintenance facility proposed for the western end of the golf course may be partially visible from Watsonville Road, ¾ mile to the west. The only evidence of the project alongside Watsonville Road would be the new maintenance access road to be constructed from Watsonville Road to the golf course maintenance facility. There would be no structural entry features such as signage here since no public access to the golf course would be permitted from this direction.

In the interior area of the valley, the golf course, clubhouse and overnight units would not be visible from off-site vantage points, even from the single dwelling that overlooks the valley from the adjacent ridge to the north. From the vantage point of this residence, the clubhouse/overnight complex would be completely blocked by the intervening low hills and ridges just north of the complex. <u>However, the winery complex would be visible from the residence, although it would be at least 2,000 feet away.</u>

Mitigation 1. **The project would be designed and landscaped in a manner to help it blend in with the natural and rural surroundings, and to reduce its visibility from off-site locations.**

The site planning measures proposed as part of the project, including buffer zones from all adjacent roadways, as well as the proposed landscaping and berming, would minimize the potential visual effects of the project. The design of the residential areas reflects many of the guidelines of the San Martin Integrated Design Plan (see Section *II. Consistency with Plans, Policies and Regulations.)*

All structural elements such as signs, fences, lighting or other entry features would be subject to Architectural and Site Approval to ensure their compatibility with the surroundings. In addition, any structures proposed within 100 feet of adjacent scenic roads would be subject to the County's Design Guidelines.

K. TRAFFIC AND CIRCULATION

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Impacts and Mitigation

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Impact 1. **The project would result in increased traffic generation at the project site. (Potential Significant Impact)**

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The winery would generate a small volume of traffic which would primarily consist of daily trips by 8 permanent employees and 6 additional temporary employees during the harvest and crush season. There would also be a small number of trips (an average of 5 per week) generated by guests, who would visit the winery by appointment only. Truck trips generated would include approximately 40 truck loads of finished product, which would occur periodically throughout the year, and occasional trips by delivery and service vehicles. Since all vehicles would access the winery site from Watsonville Road, they would not contribute to traffic on roadways east of the CordeValle site. The small increment of traffic from the winery would not significantly affect traffic operations on Watsonville Road.

L. NOISE

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Impacts and Mitigation

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Impact 5. **Noise levels would be temporarily elevated during grading and construction. (Potential Significant Impact)**

Most of the existing noise receptors in the area are far from the main grading and construction area of the golf course. The major exception is the existing ranch house at the east end of the site. During construction, maximum noise levels generated by grading, paving, and other activities would be 5 to 10 decibels lower. If average levels do not exceed 55 dBA, there would be no interference with outdoor activity or indoor activity, although the construction may be occasionally audible. Noise levels at the existing ranch could reach as high as 80 dBA with average levels of up to 75 dBA. During most of construction, however, noise levels would be significantly below 55 dBA.

The existing residence on the ridge to the north of the project site would be approximately 1,200 feet from the nearest grading activity for the golf course. At this distance, the sound of equipment would be noticeable but would not exceed 55 dBA.

At the northeastern corner of the site, existing dwellings along and near the western extension of San Martin Avenue (west of Coolidge Avenue) would be subject to short-term noise from the grading and construction of the water tank access road commencing southwestward from the end of San Martin Avenue. These residences would also be subject to temporary noise from truck traffic generated during the construction of the water tank.

At the eastern end of the project site, existing dwellings in the vicinity would be subject to short-term grading and construction noise impacts from construction of the perimeter berms, the detention basin along Coolidge Avenue, the package wastewater treatment plant and lake/detention basin along Turlock Avenue, and to a lesser extent the proposed residential subdivisions which would be set back from the site boundary.

At the western end of the site, the construction of the maintenance access road to Watsonville Road would generate noise from grading and paving. The nearest existing dwelling would be 700 feet from this maintenance road at its nearest point, and would not be subject to construction noise impacts, although the noise would be audible.

Mitigation 5. **Short-term construction noise impacts would be reduced through compliance with the County's Noise Ordinance with respect to hours of operation and maximum noise levels at adjacent property lines. At the eastern edge of the project, the berms proposed along the project boundary would be constructed during the early phases of grading to provide a noise barrier for existing residences nearby.**

The Noise Ordinance stipulates that construction noise generated between 7 am and 7 pm on weekdays and Saturdays should reach noise levels no greater than 75 dBA at an adjoining property line of a single-family or two-family dwelling.

These hours would be enforced by the grading inspector, and also the County Department of Environmental Health in the event of a violation of the County Noise Ordinance.

To minimize noise generation, construction equipment should be maintained in good operating condition and properly muffled.

To further reduce construction noise impacts, the berms proposed for the eastern project boundaries would be constructed during the early phases of grading in order to provide shielding from construction and grading in the interior of the project. This would be particularly effective in attenuating noise from grading and excavation for the detention basin along Coolidge Avenue, and the package wastewater treatment plant and lake/detention basin along Turlock Avenue.

P. WATER SUPPLY

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Impacts and Mitigations

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<u>Impact 1</u>. **The proposed project would increase the demand for water at the site. (Potential Significant Impact)**

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<u>Maintenance Facility</u>: It is estimated that the maintenance facility would use 225 gpd for domestic use, based on 15 employees at 15 gpd per employee. The washdown estimates are provided below.

<u>Winery/Grape Processing Center: Maximum domestic water used at the winery would be based on the maximum number of employees (14) at 15 gpd per employee, for a daily consumption of 210 gpd. In addition, an average of approximately 2,000 gpd of non-potable water would be used for washing down the vats and equipment.</u>

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Mitigation 1a. **Increased water supplies to meet project demand for domestic water would be provided by the West San Martin Water Works, without adversely affecting existing or future users.**

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<u>The project includes a 400,000-gallon water tank to be constructed in the northeast portion of the project approximately 4,000 feet northwest of the Coolidge Avenue/Highland Avenue intersection.</u> ~~In the near future, the water company plans to construct a new 300,000 gallon water tank at an existing tank site on Hayes Lane, approximately ¾ mile north of the proposed clubhouse.~~ This tank is being constructed to improve existing low pressure problems in the system, to enhance fire protection capability, and to provide for projected future growth <u>in the San Martin area</u>. With the completion of this tank, the water company would have sufficient capacity to meet the estimated water demands and fire flow requirements for the Lion's Gate project.

Q. WASTEWATER TREATMENT AND DISPOSAL

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Impacts and Mitigations

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Mitigation 1. **Increased wastewater from the project would be treated and disposed of with new facilities to be constructed in conjunction with the project.**

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Maintenance Facility

The maintenance facility would not be connected to the centralized wastewater system, but would have its own septic tank and leachfield system. Based on a generation rate of 15 gpd for 15 employees, maximum flows would be 225 gpd. Preliminary soils and groundwater studies indicate that there is adequate depth to groundwater, and that the soils in the vicinity have acceptable percolation rates for the planned leachfield.

Winery/Grape Processing Center

The winery is also planned to have its own septic tank and leachfield system. Based on a generation rate of 15 gpd per person for a maximum of 14 employees during the harvest and crush, maximum flows would be 210 gpd. Wet weather percolation tests have not yet been conducted to determine the suitability of the soils at the winery site for leachfields (these tests are planned to be conducted in the winter of 1999). In the event the soils are found unsuitable, the alternative plan is to pipe the domestic effluent to the nearby golf course maintenance facility septic system for treatment and disposal. The siting and design of the septic tank and leachfield system for the winery would be subject to the criteria and standards of the Santa Clara County Department of Environmental Health.

Washdown water from cleaning the vats and equipment would be piped to two small treatment ponds occupying a 0.5-acre area south of the winery building. This washdown water would be screened for organic material before being piped to the ponds. The washwater would include some residue from cleaning detergents and minor amounts of chemicals used in the wine making process. The treatment ponds would include aerators to prevent stagnation and odor generation, which would also prevent mosquito breeding. Some of the treated washwater would evaporate from the pond, and the remainder would be used for irrigation or frost protection in the vineyards. The organic material screened from the washwater would be applied to the vineyards or used in making mulch for soil amendment. The design and installation of the wastewater treatment ponds would be subject to the approval of the Central Coast Regional Water Quality Control Board.

APPENDICES

APPENDIX C

Geotechnical Reports

Prepared by

Twining Laboratories

August and October 1998

D34301.09

October 7, 1998

Lion's Gate Limited Partnership
395 Oyster Point Boulevard, Suite 309
South San Francisco, California 94080

Attention: Mr. Ron Davis

Subject: Preliminary Evaluations for
Geotechnical and Geological Feasibility:
Proposed Potable Water Storage Tank
and Proposed Winery Buildings
Cordevalle Estates
San Martin, California

Dear Mr. Ron Davis:

This letter report addresses the geotechnical feasibility of the proposed water storage tank and the winery buildings to be located at the Cordevalle Estates. The proposed water tank is to be located on an eastward sloping swale, about 4,000 feet northwest of the intersection of Highland and Turlock Avenues, and about one-half mile north of the golf course. The winery is to be located northwest of the northwest portion of the golf course on gently rolling terrain.

The Twining Laboratories (Twining) prepared a Geotechnical Engineering Investigation report for the proposed water storage tank, which included test trenching, soil sampling, and laboratory testing of soils. Two test borings have been completed at the site of the proposed winery buildings, however, a complete geotechnical engineering investigation has not been performed. We understand that additional test borings, soil sampling and associated laboratory testing are proposed for the winery to support a design level geotechnical engineering report for that site.

PURPOSE AND SCOPE

This letter report is provided to facilitate evaluation by Santa Clara County with respect to the geotechnical and geological feasibility of the two sites. The report provides our preliminary evaluation of the geotechnical and geological feasibility of the sites.

The following tasks were performed in support of our evaluation:

I. The following previous geologic investigation reports, prepared by others, were reviewed:

Supplemental Geological Reconnaissance Investigation for Proposed Hayes Valley Dams, Santa Clara County, California, prepared by Kaldveer Associates Geoscience Consultants, August 4, 1989.

Geologic Input to Draft Environmental Impacted Report, Lions Gate Development, project HRC-101B, prepared by Wahler Associates for HR Development Partners, April 17, 1990.

Geologic Input to EIR, prepared by ENGEO Incorporated, April 13, 1993.

Geologic Feasibility Investigation, Golf Course Maintenance Building, The Lion's Gate Reserve, San Martin , California, Project 1385/6G, prepared for Hayes Valley Development Partners, by Pacific Geotechnical Engineering, December 1995.

Geologic Feasibility Investigation, Clubhouse and Overnight Lodges, The Lion's Gate Reserve, San Martin, California, Project 1385/5G, prepared for Hayes Valley Development Partners, by Pacific Geotechnical Engineering, December 1995.

Administrative Draft Environmental Impact Report, Volume IIa Technical Appendices, Lion's Gate Reserve, December 1995.

Draft Environmental Impact Report, Volume II Technical Appendices B through E, Lion's Gate Reserve, March 1996.

II. The following geologic and geotechnical reports prepared by The Twining Laboratories were reviewed:

Report entitled Preliminary Geotechnical Engineering Investigation, Golf Coarse, dated March 18, 1997, and Addendums No. 1 and No. 2.

Letter report entitled "Review of Site Geologic Conditions and Grading Plans, Golf Course Phase", dated May 6, 1997.

Report entitled Preliminary Geotechnical Engineering Investigation, Clubhouse and Overnight Lodges, dated October 30, 1997.

Preliminary Evaluation of Geotechnical and Geological Feasibility: Clubhouse and Overnight Lodges Area, dated April 16, 1998.

Geotechnical Engineering Investigation, Maintenance Building, Cordevalle Golf Club and Hotel, San Martin, California, dated July 8, 1998.

Geotechnical Engineering Investigation, Proposed Potable Water Tank, dated August 11, 1998.

Geotechnical Engineering Investigation, Proposed Cart Path, Pedestrian, and Utility Bridges, Cordevalle Estates, San Martin, California, dated September 25, 1998.

This report is provided specifically for the water storage tank and winery buildings at the proposed Cordevalle Estates, referenced in the Proposed Construction section of this report.

This investigation did not include design level geotechnical engineering investigation, floodplain investigation, agricultural compatibility assessment, compaction tests, environmental investigation, or environmental audit. This investigation was intended only to evaluate the static physical characteristics of the soils and rock at the project sites.

BACKGROUND

Site Descriptions

Water Storage Tank Site: The potable water tank site is located on an eastward sloping swale, about 4,000 feet northwest of the intersection of Highland and Turlock Avenues, and about one-half mile north of the golf course. The swale slopes at about 4 horizontal (H) to 1 vertical (V). The west edge of the proposed tank is approximately 125 feet downslope from the top of a broad ridgeline. Oak trees are present on the hillside near the near the proposed tank site. Dry brown grasses of up to 3 feet high covered the surface soils at the time of our field investigation.

According to a geologic map of the site region prepared by Kaldveer Associates (scale: 1 inch = 500 feet, 1989) for the proposed Hayes Valley Dam, the tank is located on Franciscan Complex greenstone. A serpentinite belt is located approximately 500 feet west of the proposed tank site. The nearest mapped active or potentially active fault is the Sargent-Berrocal Fault, located about 2.5 miles east of the site.

Winery Buildings Site: The winery site is located west of the northwestern most portion of the golf course, approximately 300 feet west of the number 6 green. The winery buildings are to be located near the axis of a gently sloping, north-south trending, ridge line. Slope gradients at this location range from nearly flat at the top of the ridge to a maximum slope of about 5 horizontal to 1 vertical. Dry native grasses and scattered oak trees were observed during our site reconnaissance. A pre-engineered building to be used for vineyard agricultural purposes will be located about 400 feet southwest of the winery buildings.

Anticipated Construction

Water Storage Tank:We understand the proposed potable water tank will include a 70-foot diameter reinforced concrete walled tank with an approximate capacity of 420,000 gallons. Approximately two-thirds of the tank height will be below the adjacent native grade level. The tank is proposed to have an aluminum "TEMCOR" domed roof and a 36 mil Hypalon liner covering the sides and bottom of the tank. An 8 ounce nonwoven geotextile is proposed to be placed below the bottom portion of the tank liner. The bottom surface of the tank will be sloped toward the center at a 4H to 1V gradient. The reinforced concrete walls will be supported on a 3-foot wide perimeter spread foundation. A french drain will be installed outside the entire perimeter of the reinforced concrete tank wall. A perimeter access road with a Class II aggregate base surface will be constructed around the tank.

Cuts of up to about 23 feet are proposed to achieve a level pad for the tank. The tank foundation is proposed to bear entirely on cut. Fills of about 2 to 5 feet are proposed along the downslope perimeter on the pad, beneath the perimeter access road.

Winery Buildings: We understand that the winery will comprise an approximate 20,000 square foot, wood-frame, main winery building, and a pre-engineered building to be used for vineyard agricultural purposes. Anticipated grading would include cuts and fills of up to about 5 to 8 feet.

General Geologic Conditions

The earth materials underlying the proposed water storage tank and winery sites are composed of rocks belonging to the Franciscan Complex of Jurassic to Cretaceous age. Bedrock types found within the Hayes Valley area include sandstone, shale, chert, limestone, greenstone, and low grade metamorphic rocks. Many areas of bedrock terrain include a mixture of different rock types in a sheared matrix. This formational mixture is termed a melange and was formed as a result of intense shearing and faulting. Serpentine is also found within this assemblage of rocks.

The regional trend of geologic structures in the Hayes Valley area is roughly east-west, acute to the overall geologic structure of North 40 degrees East for the Santa Cruz Mountains as a whole. Physiographic features, bedrock contacts, and faults are generally parallel to this structural trend.

The proposed water storage tank and winery buildings are located approximately 7 to 8 miles northeast of the San Andreas Fault and 6 miles southwest of the Calaveras Fault. Other active faults in the site region include the Hayward and Sargent-Berrocal faults. Regional geologic maps prepared by U.S. Geological Survey and the California Division of Mines and Geology show a bedrock fault and bedrock contacts within the melange terrain on the north side of Hayes Valley. The faults and contacts are also shown on the Geologic Index Map (Figure 1), of the Geologic Feasibility Investigation for the Clubhouse and Overnight Lodges, prepared by Pacific Geotechnical Engineering, dated December 1995.

Soil Conditions in the Site Areas

Soil conditions in the areas of the proposed water tank and winery building were revealed in test borings conducted by Twining during July and August, 1998, respectively.

Water Storage Tank Site: Near surface soils comprise silty sands at the water storage tank site. The sands extend from the ground surface to depths of approximately 1 to 2 feet below site grade (BSG). The root systems of grasses and weeds extended to depths of about 18 to 24 inches. Sandy and gravelly lean clays were present beneath the silty sands. Weathered greenstone bedrock was encountered in test pits and a test boring at depths of 5 to 7 feet BSG, extending to the maximum depths explored (41.5 feet BSG).

Winery Buildings Site: Silty sands with gravel are present at the proposed winery buildings site to depths of about 0.5 to 2.5 feet BSG. Highly weathered greenstone bedrock was encountered below the silty sand in both soil borings drilled, to the maximum depths of exploration of 6.5 and 10.5 feet BSG.

Review of Previous Geologic Investigation Reports

We have reviewed the geologic reports listed under "Purpose and Scope". Most of the cited reports present descriptions of regional geologic and tectonic conditions, and general site geologic conditions. Our summary of these regional conditions are presented above under the "Background" section of this report. Geologic conditions applicable to the subject sites, which are described in these reports, and conditions noted during our geologic field reconnaissance of the site areas are summarized in the "Evaluation" section of this report.

Geologic Field Reconnaissance

A geologic field reconnaissance of the proposed water storage tank and winery buildings areas was performed in conjunction with our review of the proposed golf course and surrounding areas performed on April 28, 1997. The reconnaissance, which included confirming previously mapped geologic features and noting potential geologic hazards, was performed by Kenneth J. Clark, Certified Engineering Geologist. The results of the geologic field reconnaissance suggest that the geologic map prepared by ENGEO is generally suitable for planning purposes for the proposed water storage tank and winery buildings project. This map is included as Figure No. 2 of the report entitled "Geologic Input for EIR For Lion's Gate Property", dated April 13, 1993 (contained in the Draft Environmental Report [DEIR]). However, we do not warrant the accuracy of the aforementioned map. Additional reconnaissance of the water storage tank and winery buildings sites was performed by Mr. Kenneth Clark on July 7, 1998, and May 5, 1998, respectively.

EVALUATION

This section presents our evaluation of potential geotechnical and geologic concerns pertinent to the water storage tank and winery buildings area, and a discussion of potential measures to mitigate the adverse conditions.

Soil and Rock Conditions

Water Storage Tank Site: The predominant soil types at the water storage tank site are silty sands and sandy and gravelly lean clays. The soils overlie weathered greenstone bedrock at depths of 5 to 7 feet BSG. The sandy soils, to depths of 1 to 2 feet BSG were generally loose. The clayey soils are anticipated to have a medium expansion potential, moderate compressibility, and the potential for moderate to high swell. However, we anticipate that the pad will be cut to a maximum depth of about 23 feet to achieve the designed tank bottom surface. This excavation would remove the majority of the loose near-surface silty sands and clayey soils. Along the perimeter of the pad (where fill is to be placed) care should be taken to remove the loose silty sand soils to a minimum depth of 1 foot BSG prior to placement of the fill. Field and laboratory data suggest that weathered greenstone rock will provide an adequate foundation material to support the water storage tank.

Based on our observations of the weathered rock in test pits, temporary cut slopes into the rock material will likely be stable up to gradients of about 3/4H to 1V. Temporary cut slopes in lean clay or silty sand soils will likely be stable to about 1H to 1V. If sloughing of the cut slope occurs, the temporary excavations should be shored or slopes flattened.

Winery Buildings Site: Soil borings indicate the winery buildings site includes silty sand with gravel underlain by highly weathered greenstone bedrock at a depth of about 0.5 to 2.5 feet BSG. The silty sands are generally loose. The loose silty sand soils will not adequately support fills, foundations, or floor slabs. These soils should be removed prior to placement of engineered fill, floor slabs, or shallow footings. Slabs and foundations should bear either entirely on engineered fill or entirely on firm native weathered bedrock.

Although not noted in the soil borings, lean clay soils (prevalent at the Cordevalle Estates project site) may be encountered during further investigation and/or grading for the winery buildings. Over time near surface clays will experience cyclic drying and wetting as the dry and wet seasons pass. Clays soils are anticipated to experience volumetric changes (shrink/swell) as the moisture content of the clay soils fluctuate. These shrink/swell cycles can impact foundations and lightly loaded slabs-on-grade even though the expansion potential is classified as medium. Expansive soils cause more damage to structures, particularly light buildings and pavements, than any other natural hazard, including earthquakes and floods (Jones and Holtz, 1973). Expansion potential may not manifest itself until months or years after construction. At most sites there exists a depth to which the moisture content of the subgrade remains essentially constant throughout the year; thus, the clays would not undergo a significant volume change below this depth. Therefore, the depth, referred to as the "critical depth", to which significant moisture fluctuation occurs influences the selection of suitable foundation and floor slab alternatives for this site. Climatic conditions, groundwater conditions, landscape irrigation, and the soil conditions effect the critical depth. Our review of moisture data and observations of near surface clay soils did not clearly demonstrate a critical zone depth. Based on experience, it is expected that the critical zone would be approximately 24 inches BSG in the site region, and that seasonal moisture fluctuation would effect soils to a depth of 2 feet BSG. The above estimate of the critical depth should be reevaluated based on soil sample test data to be generated for the proposed geotechnical and geological investigation.

Potentially expansive clayey soils may be present near the proposed locations of floor slabs or lightly loaded foundations at the winery buildings site. If clay soils are present, footings should be extended to bear at the bottom of the critical zone, at least 24 inches BSG. Over-excavation and backfilling with non-expansive engineered fill soils my be required below floor slabs. Based on soils data generated for other sites within the Cordevalle project, we anticipate that 12 to 24 inches of nonexpansive granular soil would be required between floor slabs and clayey soils. Recommendations for footings and over-excavation and placement of non-expansive engineered fill should be provided with the report of Geotechnical Engineering Investigation of the winery buildings site

Faulting

The water storage tank and winery buildings sites are located in a seismically active region with numerous active and potentially active faults. The nearest mapped active or potentially active fault is the Sargent-Berrocal Fault, located 2 to 3 miles east of the site. Several bedrock faults associated with melange terrace have been mapped by others on the Cordevalle development site. Our field reconnaissance and review of the aforementioned geologic reports, prepared by others, do not indicate the presence of faults in the immediate areas of the proposed water storage tank and winery buildings. Additionally, our review of data presented in geologic reports previously generated for the development project indicates that the bedrock faults in the site area are inactive.

The subject sites are not located in an area containing any of the State of California Earthquake Fault Zones (formerly Alquist-Priolo Special Studies Zones), established to delineate earthquake fault zones.

Considering the presence of mapped bedrock faults (inactive) in the vicinity of subject sites, it is possible that site grading for the projects may reveal shear zones or faults in the bedrock. It is generally not recommended to build a structure across a fault, active or inactive. Although the mapped faults are judged to be inactive, geologic evaluation should be conducted during grading operations. Exposed bedrock should be observed by an engineering geologist to assess the presence or absence of faults. Structures built across faults may be supported on soil or rock materials with highly variable foundation properties, and excessive differential settlement can result. Potential differential settlement may be reduced by over-excavation and placement of engineered fill over the fault, or modifying the location of the structure away from the fault.

Seismic Ground Motion

Seismic ground motion may occur at the site as a result of earthquakes on nearby active faults. The intensity of ground shaking depends on factors such as earthquake magnitude, distance to causative fault, depth to bedrock, physical characteristics of underlying soil and bedrock, and local topography. Terratech (1988) indicated that ground motions were likely to exceed 0.5 g.

Our deterministic evaluation of the potential magnitude of seismic ground motion indicates that the upper bounds earthquake event would likely produce a peak horizontal ground acceleration at the site in the range of 0.4g to 0.5g.

Native Slope Stability

Landslides on the proposed development site were mapped by others (Kaldveer Associates, 1989, and Wahler Associates, 1990). The locations of these landslides are shown on Figure No. 2 of the report entitled "Geologic Input for the Lion's Gate Property" (DEIR Volume II) which is a compilation of site data generated prior to April 1993. Previously mapped landslides were observed during our geologic field reconnaissance near the two subject sites. These slides appeared to comprise relatively shallow rotational block slides and slumps.

The aforementioned mapping studies do not indicate landslides have occurred in the immediate vicinity of the water storage tank or winery buildings sites. Field reconnaissance performed by Twining did not indicate the occurrence of notable landslides near the subject sites. Native slopes in the areas proposed for the water storage tank and winery buildings appear relatively stable.

Shallow Groundwater

Considering the proposed water storage tank location near the top of a broad swale, we anticipate that some shallow groundwater may occur near the tank pad elevation. However, the amount of groundwater is anticipated to be relatively small and it appears that potential pore pressure and nuisance conditions could be adequately addressed by installing a french drain proposed on the outside of the tank wall foundation. A french drain outside the tank wall foundation is included on the civil engineering plans for the project.

Groundwater was not encountered in exploratory borings drilled (August, 1998) at the winery buildings site. Considering the elevated topographic location of the proposed building sites, we anticipate that shallow groundwater will not have an adverse impact on the winery buildings project.

Subsequent to rough grading of the water tank and winery buildings sites, slope, soil, and rock conditions should be reviewed by Twining's civil engineer or engineering geologist for evidence of subsurface groundwater flow. Conditions favoring seeps include relatively shallow bedrock (or other impermeable layer) with an overlying permeable soil. Soil textures exhibiting a selective removal of fine particles from currently dry soils may indicate subsurface groundwater flow during wetter periods. Erosion may be accelerated and slope stability compromised where groundwater daylights (seeps) on cut slopes.

The following mitigation methods may be employed where shallow groundwater impinges on:

- Road subgrades: Trenched cut-off walls and subdrains
- Native slopes: Upslope trench cut-off wall or horizontal wick drains
- Cut slopes: Retaining wall with filter drain and weep holes

Mitigative measures should be designed by Twining's civil engineer or engineering geologist for specific areas, when adverse shallow groundwater conditions are identified.

Liquefaction and Seismic Settlement

Liquefaction describes a phenomenon in which a saturated, cohesionless soil loses strength during an earthquake as a result of induced shearing strains. Lateral and vertical movement of the soil mass, combined with loss of bearing usually results. Liquefaction can cause damage to structures during earthquake events. Foundations can literally loose support due to bearing capacity failure. The resulting displacements can induce excessive differential settlements in floor slabs and foundations. Research has shown that liquefaction potential of soil deposits induced by earthquake activity depends on soil types, void ratio, groundwater conditions, duration of shaking, and confining pressure over the potentially liquefiable soil mass. Fine, well sorted, loose sand, high groundwater conditions, higher intensity earthquakes, and particularly long duration of groundshaking are the requisite conditions for liquefaction.

Based on the anticipated shallow bedrock and paucity of well sorted loose sandy soils, as suggested by Twining's previous investigations, the water storage tank and winery buildings sites do not appear to be susceptible to liquefaction.

Seismic settlement occurs when loose, poorly graded, granular soils consolidate as a result of cyclic ground shaking associated with an earthquake. Based on the anticipated shallow bedrock and lack of well sorted loose sandy soils, the water storage tank and winery buildings sites do not appear to be susceptible to seismic settlement.

Serpentine Rock

The proposed water storage tank and winery buildings sites are not located near mapped exposures of serpentinite. Accordingly, we do not anticipate that grading operations would reveal asbestos bearing serpentinite materials. However, naturally occurring asbestos materials may be associated with serpentine rock which has been documented by previous investigators at other locations on the development property. Serpentine rock is typically a green or yellow, highly sheared and altered rock, with a fibrous appearance. In the event site grading exposes asbestos bearing materials, the location of the locations of these materials should be documented and the asbestos content should assessed by Twining.

If asbestos bearing materials are exposed during grading of the sites, or where asbestos-containing fill material is used, the potential for human exposure to asbestos should be mitigated. Exposed cuts with asbestos-containing serpentine should be gunited or covered with 12 inches of asbestos free fill. Asbestos materials used as fill should be covered with 12 inches of serpentine free fill.

CONCLUSIONS

Based on our reconnaissance and geotechnical evaluation of the water storage tank area, our reconnaissance and limited field exploration at the winery buildings site, and our understanding of the anticipated construction at the two sites, we present the following general conclusions.

- The water storage tank and winery buildings sites appear suitable for the proposed construction provided the recommendations contained in this report and design level geotechnical engineering reports are followed. It should be noted that the recommended design consultation and construction monitoring by Twining are integral to this conclusion.

- The predominant soil types at the water storage tank site are silty sands, and sandy and gravelly lean clays overlying weathered greenstone bedrock at depths of 5 to 7 feet BSG.

- Silty sands with gravel are present at the proposed winery building locations to depths of about 0.5 to 2.5 feet BSG. The silty sands are underlain by highly weathered greenstone bedrock to the maximum depths of exploration of 6.5 and 10.5 feet BSG.

- Some shallow groundwater may impact the proposed water storage tank site. Based on our estimate of the quantity and location of this shallow groundwater, the french drain proposed for behind the tank wall foundation would provide adequate subsurface drainage for the tank structure. Shallow groundwater is not anticipated to impact winery buildings. However, subsequent to rough grading of the water tank and winery buildings sites, slope, soil, and rock conditions should be reviewed by Twining's civil engineer or engineering geologist for evidence of subsurface groundwater flow. Adverse shallow groundwater can be controlled using the methods listed in the "Evaluation" section.

- Potentially expansive clayey soils may be present near the proposed locations of floor slabs or lightly loaded foundations at the winery buildings site. If clays are encountered at these locations foundations will need to be extended to the base of the critical zone (approximately 24 inches). Over-excavation and backfilling with non-expansive engineered fill soils my be required. Based on soils data generated for other sites within the Cordevalle project, we anticipate that 12 to 24 inches of nonexpansive granular soil would be required between floor slabs and clayey soils. A recommendation for over-excavation and placement of non-expansive engineered fill should be provided with the report of Geotechnical Engineering Investigation of the winery buildings site.

- Data presented in the cited reports of previous investigations do not indicate the presence of bedrock faults in the vicinity of the subject sites. The reports indicate that evidence suggests these bedrock faults are not active.

- The subject sites do not lie within published special study zones for ground surface rupture. Our literature investigation suggests that the potential for ground rupture at the subject sites associated with a known fault is low.

- A preliminary deterministic seismic evaluation indicates that the "upper bounds" earthquake event would produce peak horizontal ground acceleration at the subject sites in the range of 0.4g to 0.5g.

- Soil and rock conditions revealed at the site are not conducive to liquefaction or seismic settlement, and suggest a low potential for liquefaction and significant seismic settlement.

- We do not anticipate that grading operations would reveal asbestos bearing serpentinite materials. However, if asbestos bearing material is revealed during grading, the potential for human exposure to asbestos can be mitigated. In areas where final grading exposes asbestos-containing serpentine, or where asbestos-containing fill material is used, the potential for human exposure can be mitigated by covering with 12 inches of asbestos free engineered fill.

RECOMMENDATIONS

Based on our investigation of the water storage tank and winery buildings sites, the following recommendations are presented for use in project design. Recommendations for the proposed winery buildings are subject to change based on the results of the proposed geotechnical engineering investigation.

When applying the preliminary recommendations for design, the background information, procedures used, findings, evaluation, and conclusions should be considered. The recommended design consultation and construction monitoring by Twining are integral to the proper application of recommendations made for the subject site.

Additional Investigations

A geotechnical field investigation, laboratory investigation of soils, and evaluations should be conducted, and recommendations for site preparation, foundations, slabs-on-grade, and pavements should be prepared prior to construction of the proposed winery buildings. A geotechnical engineering investigation report has been prepared for the water storage tank site (Twining, August 11, 1998).

Even after submittal of the geotechnical and geological engineering investigation report, conditions may be encountered during grading, or the scope of the project may change such that additional or altered recommendations may be warranted as an addendum to the geotechnical engineering investigation report. Twining should observe the project sites after rough grading to assess the potential presence of faults, asbestos containing soils, shallow groundwater, loose soils, or expansive clayey soils.

Potential mitigative measures for adverse conditions are described in the "Evaluation" section of this report. Mitigative measures should be designed by Twining's civil engineer or engineering geologist for specific areas, if necessary.

When grading plans have been generated, Twining should be provided the opportunity to review the plans. Conclusions and recommendations presented in this report, as well as the geotechnical engineering investigation reports, should be incorporated into the final design of the water storage tank and winery buildings.

Twining should be contacted to provide an inspection of final grading.

CONSTRUCTION MONITORING

It is recommended that Twining be retained to observe the excavation and earthwork phases of the subject project to determine that the subsurface conditions are compatible with those referenced in this report and identified in the proposed geotechnical and geological engineering investigation report. These services should include site review by an engineering geologist at least monthly.

Twining should conduct the necessary observation, field testing services and provide results so that action necessary to remedy potential deficiencies can be taken in accordance with the plans and specifications. Upon completion of the work, a written summary of observations should be prepared including field testing and conclusions regarding the conformance of the completed work to the intent of the plans and geologic and geotechnical specifications.

Upon the completion of work, a final engineering geology report should be prepared by Twining. This report is essential to ensure that recommendations are incorporated into the project construction, and to note any deviations from the project plans and specifications. The client should notify Twining upon the completion of work to provide this report.

DESIGN CONSULTATION

Twining should be provided the opportunity to review those portions of the contract drawings and specifications that pertain to earthwork and foundations prior to finalization to determine whether they are consistent with our recommendations.

If Twining is not afforded the opportunity for review, we assume no liability for the misinterpretation of our conclusions and recommendations. This review is documented by a formal plan/specification review report provided by Twining.

NOTIFICATION AND LIMITATIONS

The conclusions and recommendations presented in this report are based on the information provided regarding the proposed construction, and the results of the research of background information, combined with interpolation of the subsurface conditions from investigations conducted at nearby sites. A design level geotechnical investigation is necessary for prior to construction of the winery buildings.

The focus of our investigation was the proposed water storage tank and winery buildings sites and pertains only to geologic and geotechnical concerns of this site. Potential geotechnical and geologic hazards to structures on or outside of the subject site were not evaluated in this report.

If variations or undesirable conditions are encountered during construction, Twining should be notified promptly so that these conditions can be reviewed and our recommendations reconsidered where necessary. It should be noted that unexpected conditions frequently require additional expenditures for proper construction of the project.

If the proposed construction is relocated or redesigned, or if there is a substantial lapse of time between the submission of our report and the start of work (over 12 months) at the site, or if conditions have changed due to natural cause or construction operations at or adjacent to the site, the conclusions and preliminary recommendations contained in this report should be considered invalid unless the changes are reviewed and our conclusions and recommendations modified or approved in writing.

Changed site conditions, or relocation of proposed structures, may require additional investigations to determine if our conclusions and recommendations are applicable considering the changed conditions or time lapse.

The conclusions and recommendations contained in this report are valid only for the project discussed in the "Anticipated Construction" section of this report. The entity or entities that use or cause to use this report or any portion thereof for a structure or site other than those indicated in the "Background" section of this report shall hold Twining, its officers and employees harmless from any and all claims and provide Twining's defense in the event of a claim.

This report is issued with the understanding that it is the responsibility of the client to transmit the information and preliminary recommendations of this report to developers, owners, buyers, architects, engineers, designers, contractors, subcontractors, and other parties having interest in the project so that the steps necessary to carry out these preliminary recommendations in the design, construction and maintenance of the project are taken by the appropriate party.

This report presents the results of a preliminary investigation of geotechnical and geological feasibility, and should not be construed as a geotechnical report, or an environmental audit or study.

Our professional services were performed, our findings obtained, and our recommendations prepared in accordance with generally-accepted engineering principles and practices in Santa Clara County, California at the time of the investigation. This warranty is in lieu of all other warranties either expressed or implied.

Reliance on this report by a third party (i.e., that is not a party to our written agreement) is at the party's sole risk. If the project and/or site is purchased by another party, the purchaser must obtain written authorization and sign an agreement with Twining in order to rely upon the information provided in this report for design or construction of the project.

CLOSING

We appreciate the opportunity to be of service to Lion's Gate Estate Partners. If you have any questions regarding this report, or if we can be of further assistance, please contact us at your convenience.

Sincerely,
THE TWINING LABORATORIES, INC.

Kenneth J. Clark, CEG
Project Geologist

CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA
Exp 5-31-99

cc: Mr. Burt Verrips

F:\eng\geotech\D3430109.01

KC/pc

REFERENCES

Kaldveer, 1990, Supplemental Geological Reconnaissance Investigation for Proposed Hayes Valley Dams, Santa Clara County, California, prepared by Kaldveer Associates Geoscience Consultants, August 4, 1989.

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GEOTECHNICAL ENGINEERING INVESTIGATION
PROPOSED POTABLE WATER TANK
CORDEVALLE GOLF CLUB AND HOTEL
SAN MARTIN, CALIFORNIA

Project Number: D34301.02

Prepared for:

Lions Gate Estate Partners, LLC
405 El Camino Real, Suite 127
Menlo Park, California 94025

August 11, 1998

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August 11, 1998

D34301.02-06

Lion's Gate Estate Partners, LLC
405 El Camino Real, Suite 127
Menlo Park, California 94025

Attention: Mr. Tom Hix

Subject: Geotechnical Engineering Investigation
Proposed Potable Water Tank
Cordevalle Golf Club and Hotel
San Martin, California

Dear Mr. Hix:

We are pleased to submit this geotechnical engineering investigation report prepared for the proposed potable water tank at the Cordevalle Golf Club and Hotel located west of the City of San Martin, in Santa Clara County, California. The contents of this report include the purpose of the investigation, scope of services, background information, investigative procedures, our findings, evaluation, conclusions, and recommendations.

We recommend that those portions of the plans and specifications that pertain to earthwork, and foundations be reviewed by The Twining Laboratories, Inc. (Twining) to determine if they are consistent with our recommendations. This service is part of this current contractual agreement and the client should provide these documents for our review prior to their issuance for construction bidding purposes.

In addition, it is recommended that Twining be retained to provide inspection and testing services for the excavation, earthwork, and foundation phases of construction. These services are necessary to determine if the subsurface conditions are consistent with those used in the analysis and formulation of recommendations for this investigation, and if the construction complies with our recommendations. This service is not, however, part of this current contractual agreement.

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Salinas, CA 93907
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We would appreciate the opportunity to provide a proposal for this additional service after construction documents are completed. Mr. Harry Moore with our firm (800-268-7021) will contact you in the near future regarding these services.

We appreciate the opportunity to be of service to Lion's Gate Estate Partners, LLC. If you have any questions regarding this report, or if we can be of further assistance, please contact us at your convenience.

Sincerely,
THE TWINING LABORATORIES, INC.

Kenneth J. Clark, CEG
Engineering Geologist

EXECUTIVE SUMMARY

The proposed Cordevalle Golf Club and Hotel will include a 70-foot diameter reinforced concrete potable water tank with an approximate capacity of 420,000 gallons. The tank will have an aluminum "TEMCOR" domed roof and a 36 mil Hypalon liner covering the sides and bottom of the tank. The tank is to be located in a gentle swale with approximately two-thirds of the tank height below the adjacent native grade level. The reinforced concrete walls will be supported on a 3-foot wide perimeter spread foundation. A french drain will be installed outside the entire perimeter of the reinforced concrete tank wall. The tank will have a perimeter access road surfaced with Type II aggregate base.

The Twining Laboratories, Inc. (Twining) was authorized on December 12, 1997, by Mr. Thomas Hix with Lion's Gate Estate Partners, LLC, to conduct this geotechnical engineering investigation.

The purpose of this investigation was to provide geotechnical engineering parameters for earthwork, site preparation, and preliminary information for preparation of related construction documents. The investigation included a field exploration and laboratory testing program, evaluation of the data collected during the field and laboratory portions of the investigation, and preparation of this report.

Reconnaissance of the site consisted of walking the site and noting visible surface and slope features. The reconnaissance was conducted by Mr. Kenneth Clark on July 7, 1998. Maximum native slopes within the swale at the proposed tank location range from about 4 horizontal (H) to 1 vertical (V) to 5H to 1V. Our reconnaissance did not reveal evidence of existing slope failure near the proposed tank location. Native slopes in the area of the proposed tank appear relatively stable.

On July 7, 1998 one (1) test boring was drilled near the proposed tank location to a depth of 41.5 feet below site grade (BSG). In addition, two (2) test pits were excavated below the proposed tank location to depths of 11 and 12 feet BSG. Soil samples were collected from the boring and pits for testing.

Soil conditions encountered during the field investigation were relatively consistent across the project site. The near surface soils were silty sands to depths of about 1 to 2 feet BSG. Gravelly and sandy lean clays were encountered below the silty sands to depths of 5 to 7 feet BSG. The lean clay soils exhibit low to moderate shear strength and moderate compressibility characteristics.

Weathered greenstone bedrock was encountered below the lean clays to the maximum depths of exploration in the boring and test pits.

Based on the Potable Tank Section diagram provided by PACE it appears the grading for the tank pad will extend to a maximum of about 24 feet below the existing site grade. Soil and rock conditions revealed in the test boring and test pits suggest variable degrees of weathering and generally rippable conditions for the greenstone bedrock to the anticipated elevations required for pad preparation. However, during test pit exploration, the backhoe was unable to excavate the pits to an even depth across the bottom of the test pits and encountered refusal at 8 to 12 feet BSG on relatively fresh greenstone rock in some portions of pits.

Field data suggests that some shallow groundwater may occur near the tank pad elevation. However, the amount of groundwater is anticipated to be relatively small and it appears that potential pore pressure and nuisance conditions would be adequately addressed by the french drain proposed outside of the wall foundation.

From a geotechnical standpoint, the site is suitable for the proposed tank provided the recommendations contained in this report are followed.

We anticipate that the pad will be cut to a maximum depth of about 23 feet BSG to achieve the designed tank bottom surface (at the center of the tank). The tank wall footings will be at depths ranging from about 10 to 23 feet below existing site grades. Field data indicates the base of the footings will be on variably weathered greenstone bedrock. Conditions at the proposed footing depths are anticipated to be predominantly competent greenstone. However, due to the irregular weathering profile, some lean clay soils are anticipated. Where lean clay soils are exposed at the bottom of foundation excavations, these soils should be excavated down to firm rock material and the excavations should be backfilled with a lean (2-sack) cement slurry to establish a level foundation bottom.

To address potential differential settlement of the tank bottom liner the tank pad should be prepared by ripping and moisture conditioning to a depth of 8 inches below pad grade and compacting soils as engineered fill. The intent of pad preparation is also to provide a uniform base free of sharp rocks which could puncture the bottom liner.

After excavation of the tank pad, and prior to placement of footings and the bottom liner, the subgrade should be reviewed by our firm to confirm the removal of soft or pliant areas.

A 25-foot high cut slope with a gradient of 2 horizontal (H) to 1 vertical (V) is proposed upslope of the tank. The majority of this cut is anticipated to be into weathered greenstone rock. Our observations of the greenstone rock materials exposed in test pits suggest that the proposed cut slope would be stable.

For stability, permanent fill and cut slopes should be constructed at 2H to 1V, horizontal to vertical, or flatter. Where fill is placed on native slopes steeper than 5H:1V a minimum 6 foot wide keyway should be constructed at the toe of fill slopes.

Analytical results of a near surface soil sample indicate the soils are "mildly corrosive". Buried metal objects should be protected in accordance with the manufacturer's recommendations based on a "mildly corrosive" corrosion potential of the soil. The evaluation was limited to the effects of soils to metal objects; corrosion due to other potential sources, such as stray currents and groundwater, was not evaluated.

Corrosion of concrete due to sulfate attack is not anticipated based on concentration of sulfates indicating a "negligible" exposure, as determined for the near-surface soils. Type I or II cement may be used as specified in Table No. 19-A-3 of the 1994 Uniform Building Code.

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GEOTECHNICAL ENGINEERING INVESTIGATION

PROPOSED POTABLE WATER TANK

CORDEVALLE GOLF CLUB AND HOTEL

SAN MARTIN, CALIFORNIA

Project Number: D34301.02

1.0 INTRODUCTION

This report presents the results of a geotechnical engineering investigation for the proposed proposed potable water tank to be located at the Cordevalle Golf Club and Hotel, Subdivision and Country Club, San Martin, California.

The Twining Laboratories, Inc. (Twining) was authorized by written agreement on December 12, 1997 by Mr. Thomas Hix, with Lion's Gate Estate Partners, LLC, to conduct this geotechnical engineering investigation.

The contents of this report include the purpose of the investigation and the scope of services provided. The site history, previous studies, existing site features, and anticipated construction are discussed. In addition, a description of the investigative procedures used and the subsequent findings obtained are presented. Finally, the report provides an evaluation of the findings, general conclusions, and related recommendations. The three report appendices contain the drawings (Appendix A), the logs of test pits and borings (Appendix B), and the results of laboratory tests (Appendix C).

The Geotechnical Engineering Division of Twining, headquartered in Fresno, California, performed the investigation.

2.0 PURPOSE AND SCOPE OF INVESTIGATION

The purpose of the investigation was to conduct a field exploration and laboratory testing program, evaluate the data collected during the field and laboratory portions of the investigation, and provide the following:

a) General subsurface soil and groundwater conditions;

b) Recommendations for site preparation including preparation of subgrade soils as well as placement, moisture conditioning, and compaction of engineered fill soils;

c) Recommendations for cut and fill slopes;

d) Recommendations for temporary excavations and trench backfill;

e) Geotechnical parameters for use in design of foundations; and

f) Evaluation of soil corrosivity.

This report is provided specifically for the proposed potable water tank of the proposed Cordevalle Golf Club and Hotel, referenced in the Proposed Construction section of this report.

This investigation did not include a geologic/seismic hazards evaluation, floodplain investigation, compaction tests, environmental investigation, environmental audit, or investigation of soil conditions for a tank access road. The Cordevalle Golf Club and Hotel will consist of the development of a 41-lot residential development, 18 hole golf course and associated maintenance facilities, club house, tennis courts, overnight lodges, equestrian center, and winery.

Our proposal, dated December 12, 1997, outlined the scope of our services. The actions undertaken during the investigation are summarized as follows.

I. The following documents prepared by others were reviewed:

- o Prepurchase Site Assessment of Geologic Hazards, Ground Water Supply and Environmental/Toxic Contamination, Hayes Valley Property, Santa Clara, California, Project 4297, prepared for LAND USE, by TERRATECH, INC., dated January 20, 1988;

- o Supplemental Geological Reconnaissance Investigation for Proposed Hayes Valley Dams, Santa Clara County, California, prepared by Kaldveer Associates Geoscience Consultants, dated August 4, 1989;

- o Geologic Input to Draft Environmental Impacted Report, Lion's Gate Development, project HRC-101B, prepared by Wahler Associates for HR Development Partners, dated April 17, 1990;

- o Geologic Input to EIR, prepared by ENGEO Incorporated, date April 13, 1993;

- o Geologic Feasibility Investigation, Golf Course Maintenance Building, The Lion's Gate Reserve, San Martin , California, Project 1385/6G, prepared for Hayes Valley Development Partners, by Pacific Geotechnical Engineering, dated December 1995;

- o Preliminary Geologic Feasibility Evaluation, Homesites on Parcels #24, #25, and #26, The Lion's Gate Reserve, San Martin, California, Project 1385/7G, prepared for Hayes Valley Development Partners, by Pacific Geotechnical Engineering, dated December 1995;

- o Geologic Feasibility Investigation, Clubhouse and Overnight Lodges, The Lion's Gate Reserve, San Martin, California, Project 1385/5G, prepared for Hayes Valley Development Partners, by Pacific Geotechnical Engineering, dated December 1995;

- o Administrative Draft Environmental Impact Report, Volume IIa Technical Appendices, Lion's Gate Reserve, dated December 1995;

- o Draft Environmental Impact Report, Volume II Technical Appendices B through E, Lion's Gate Reserve, dated March 1996; and

- o Final Grading Plan, prepared by Pacific Advanced Civil Engineering, dated May 5, 1998.

II. The following geologic and geotechnical reports prepared by Twining were reviewed:

- o Report entitled Preliminary Geotechnical Engineering Investigation, Golf Course, dated March 18, 1997, and Addendums No. 1 and No. 2;

- o Letter report entitled "Review of Site Geologic Conditions and Grading Plans, Golf Course Phase", dated May 6, 1997;

- o Report entitled "Preliminary Geotechnical Engineering Investigation, Clubhouse and Overnight Lodges" (former proposed site), dated October 30, 1997;

- o Letter report entitled "Preliminary Evaluation of Geotechnical and Geological Feasibility, Clubhouse and Overnight Lodge Area" (proposed new site), dated April 16, 1998; and,

- o Geologic and Geotechnical Site Review: New Clubhouse and Overnight Lodge Area, Cordevalle Golf Club and Hotel, dated May 29, 1998;

III. A site reconnaissance and subsurface exploration were conducted.

IV. Laboratory tests were conducted to determine selected physical and engineering properties of the subsurface soils.

V. Mr. Ron Davis (Lion's Gate Estate Partners, LLC), and Mr. Joseph Gutierrez (PACE) were consulted during the investigation.

VI. The data obtained from the investigation were evaluated to develop an understanding of the subsurface conditions and engineering properties of the subsurface soils.

VII. This report was prepared to present the purpose and scope, background information, field exploration procedures, findings, evaluation, conclusions, and recommendations.

3.0 BACKGROUND INFORMATION

The site history, previous studies, existing site features, and the anticipated construction are summarized in the following subsections.

3.1 Site History: The site appears to have been used for cattle grazing. No evidence of other site uses were noted during our field investigation.

3.2 Previous Studies: It is our understanding that no other studies have been conducted specifically for the proposed potable water tank site. Numerous engineering, geological, and environmental studies have been conducted for other portions of the Cordevalle development.

3.3 Site Description: The Cordevalle Golf Club and Hotel includes a 1,676 acre site of which 400 acres are to be developed, and the remainder is to remain undeveloped. The project site is located approximately west of the intersection of Highland and Turlock Avenues west of the City of San Martin in Santa Clara County, California. A site location map is presented on Drawing No. 1 in Appendix A.

The potable water tank site is located on an eastward sloping swale, about 4,000 feet northwest of the intersection of Highland and Turlock Avenues, and about one-half mile north of the golf course. The swale slopes at about 4H to 1V. The west edge of the proposed tank is approximately 125 feet downslope from the top of a broad ridgeline.

Oak trees are present on the hillside near the near the proposed tank site. Dry brown grasses of up to 3 feet high covered the surface soils at the time of our field investigation.

According to a geologic map of the site region prepared by Kaldveer Associates (scale: 1 inch = 500 feet, 1989) for the proposed Hayes Valley Dam, the tank is located on Franciscan Complex greenstone. A serpentinite belt is located approximately 500 feet west of the proposed tank site. The nearest mapped active or potentially active fault is the Sergant Fault, located 2.5 miles east of the site.

3.4 Proposed Construction: We understand the proposed potable water tank will include a 70-foot diameter reinforced concrete walled tank with an approximate capacity of 420,000 gallons. Approximately two-thirds of the tank height is below the adjacent native grade level. The tank will have an aluminum "TEMCOR" domed roof and a 36 mil Hypalon liner covering the sides and bottom of the tank. An 8 ounce nonwoven geotextile will be placed below the bottom portion of the tank liner. The bottom surface of the tank will be sloped toward the center at a 4H to 1V gradient. The reinforced concrete walls will be supported on a 3-foot wide perimeter spread foundation. A french drain will be installed outside the entire perimeter of the reinforced concrete tank wall.

A perimeter access road with a Class II aggregate base surface will be constructed around the tank.

Drawing 3 in Appendix A presents a cross section of the tank.

3.5 Proposed Construction Grading: Cuts of up to about 23 feet are proposed to achieve a level pad for the tank. The tank foundation is proposed to bear entirely on cut. Fills of about 2 to 5 feet are proposed along the downslope perimeter on the pad, beneath the perimeter access road.

4.0 INVESTIGATIVE PROCEDURES

The field exploration and laboratory testing program conducted for this investigation are summarized in the following subsections.

4.1 Field Exploration: The field exploration consisted of a site reconnaissance, drilling of a test boring, excavation of test pits, and soil sampling. The test boring and test pit locations are shown on Drawing No. 2 in Appendix A. Due to the relatively steep gradient of ground surface at the proposed tank site, the drill rig could not access test boring locations within the tank footprint. However, one test boring was drilled approximately 120 west of the proposed west edge of the tank, near a level natural ridge.

Test boring and pit locations were determined by pacing with reference to survey stakes placed at the center and on the perimeter of the proposed tank. The locations, as described, should be considered accurate to within 15 feet.

4.1.1 Site Reconnaissance: The site reconnaissance consisted of walking the site and noting visible surface features. The reconnaissance was conducted by Mr. Kenneth Clark on July 7 1998. The features noted are described in the background information (Section 3.0).

4.1.2 Drilling Test Borings: On July 7, 1998 one (1) test boring was drilled west of the proposed tank site, approximately 120 feet from the edge of the proposed tank. The boring was advanced to a depth of 41.5 feet BSG.

Under the direction of Twining's engineering geologist, the test boring was drilled using a CME-75 drill rig equipped with 6 5/8 inch hollow-stem augers. The soils encountered in the test boring were logged by Twining's field engineer. The field soil classification was in accordance with the Unified Soil Classification System and consisted of particle size, color, and other distinguishing features of the soil.

The presence and elevation of free water, if any, in the borings were noted and recorded during drilling and immediately following completion of borings.

Elevations of the test borings were not measured as a part of the investigation. The test borings were loosely backfilled with material excavated during the drilling operations; thus, some settlement should be anticipated.

4.1.3 Excavation of Test Pits: On July 7, 1998, two (2) test pits were excavated below the plan area of the proposed tank. These pits were excavated to depths of 7 and 10 feet BSG. Under the direction of a Twining engineering geologist, the test pits were excavated using a backhoe equipped with a 24 inch wide bucket.

The test pits were loosely backfilled with excavation material; thus, some settlement should be anticipated. Portions of the pits located outside the cut areas should be re-excavated and replaced as engineered fill during earthwork operations.

4.1.4 Soil Sampling: Standard penetration tests were conducted, and both disturbed and undisturbed soil samples were obtained.

The standard penetration resistance, N-value, is defined as the number of blows required to drive a standard split barrel sampler into the soil. The standard split barrel sampler has a 2 inch O.D. and a 1-3/8 inch inside diameter (I.D.). The sampler is driven by a 140 pound weight free falling 30 inches. The sampler is lowered to the bottom of the bore hole and set by driving it an initial 6 inches. It is then driven an additional 12 inches and the number of blows required to advance the sampler the additional 12 inches is recorded as the N-value.

Relatively undisturbed soil samples for laboratory tests were obtained by pushing or driving a California modified split barrel ring sampler into the soil. The soil was retained in brass rings, 2.5 inches O.D. and 1 inch in height. The lower 6 inch portion of the samples were placed in close-fitting, plastic, air-tight containers which, in turn, were placed in cushioned boxes for transport to the laboratory.

Soil samples obtained were taken to Twining's laboratory for classification and testing.

4.2 Laboratory Testing: The laboratory testing was programmed to determine selected physical and engineering properties of the soils underlying the site. The tests were conducted on disturbed and undisturbed samples representative of the subsurface material.

The results of laboratory tests are summarized on Figure Nos. 1 through 4 in Appendix C. These data, along with the field observations, were used to prepare the final test boring and test pit logs in Appendix B.

5.0 FINDINGS

The findings of the field exploration and laboratory testing are summarized in the following subsections.

5.1 Soil Profile: Silty sands were encountered from the ground surface to depths of approximately 1 to 2 feet BSG. The root systems of grasses and weeds along with desiccation cracking extended to depths of about 18 to 24 inches. Beneath the silty sands, the soils encountered were sandy and gravelly lean clays. Weathered greenstone bedrock was encountered at depths of 5 to 7 feet BSG, extending to the maximum depths explored in the test boring (41.5 feet BSG) and test pits (7 and 10 feet BSG).

The foregoing is a general summary of the soil conditions encountered in the test pits drilled for this investigation. Detailed descriptions of the soils encountered at the test boring and test pits are presented on the logs of test borings in Appendix B. The stratification lines shown on the logs represent the approximate boundary between soil types; the actual in-situ transition may be gradual.

5.2 Soil Engineering Properties: The natural moisture content measured in a sample of the silty sand was 5 percent.

The natural moisture content measured in samples of the lean clay ranged from 2 to 13 percent. A maximum density/optimum moisture determination performed on one near-surface soil sample indicated a maximum dry density of 114.8 pounds per cubic foot at an optimum moisture content of 18.8 percent.

The natural moisture content measured in samples of the weathered greenstone rock ranged from 2 to 5 percent and one in-place density test revealed a dry density of 125 pounds per cubic foot. A direct shear test performed on a lean clay sample indicated and angle of internal friction of 28 degrees, with a cohesion value of 369 pounds per square foot. The weathered greenstone soils exhibited moderate compressibility characteristics with the addition of moisture as indicated by one consolidation test (about 8.2 percent consolidation under a load of 4 kips per square foot). Upon inundation, the soils exhibited low collapse potential (about 1.6 percent collapse under a load of 0.5 kips per square foot).

5.3 **<u>Groundwater Conditions</u>:** Groundwater was not encountered in the test pits excavated below the proposed tank location to a maximum depth of 10 feet BSG. Wet soil and rock material was encountered at a depth of 35 feet (estimated to be 15 to 20 feet below existing site grade at the proposed center of the tank. However, free groundwater was not encountered in the test boring to the maximum depth of exploration of 41.5 feet BSG.

It should be recognized that water table elevations and potentiometric conditions fluctuate with time, since they are dependent upon seasonal precipitation, irrigation, land use, and climatic conditions as well as other factors. Therefore, water level observations at the time of the field investigation may vary from those encountered both during the construction phase and the design life of the project. The evaluation of such factors was beyond the scope of this investigation and report.

6.0 EVALUATION

The data and methodology used to develop conclusions and recommendations for project design and preparation of construction specifications are summarized in the following subsections. The evaluation was based upon the subsurface conditions determined from the investigation and our understanding of the proposed construction.

6.1 **<u>Soil, Rock, and Groundwater Conditions</u>:** The soil conditions encountered in the test boring and test pits were relatively consistent across the project site as indicated on the test boring and test pit logs (Appendix B). The near surface soils were silty sands to depths of about 1 to 2 feet BSG. Hard gravelly and sandy lean clays were encountered below the silty sands to depths of 5 to 7 feet BSG. Weathered greenstone bedrock was encountered below the lean clays to the maximum depths of exploration in the boring and test pits. The lean clay soils exhibit low to moderate shear strength and moderate compressibility characteristics.

Bedrock was encountered during the field investigation at depths of 5 to 7 feet BSG. Based on the Potable Tank Section diagram provided by PACE it appears the grading for the tank pad will extend to a maximum of about 24 feet below the existing site grade. Soil and rock conditions revealed in the test boring and test pits suggest variable degrees of weathering and generally rippable conditions for the greenstone bedrock to the anticipated elevations required for pad preparation. However, during test pit exploration, the backhoe was unable to excavate the pits to a consistent depth, suggesting variable weathering conditions across the test pits.

Based on field data (subsection 5.3), and considering the proposed tank location near the top of a broad ridgeline, we anticipate that some shallow groundwater may occur near the tank pad elevation. However, the amount of groundwater is anticipated to be relatively small and it appears that potential pore pressure and nuisance conditions would be adequately addressed by the french drain proposed on the outside of the wall foundation.

6.2 Stability of Native and Proposed Cut Slopes: Maximum native slopes within the swale at the proposed tank location range from about 4H to 1V to 5H to 1V. Our investigation did not reveal evidence of existing slope failure near the proposed tank location. Native slopes in the area of the proposed tank appear relatively stable.

A 25-foot cut slope with a gradient of 2H to 1V is proposed upslope of the tank. The majority of this cut is anticipated to be into weathered greenstone rock. Our observations of the greenstone rock materials exposed in test pits suggest that the proposed cut slope would be stable.

6.3 Faults: The project site is located in a seismically active region with numerous active and potentially active faults. The nearest mapped active or potentially active fault is the Sergant Fault, located 2.5 miles east of the site. Several bedrock faults associated with melange terrace have been mapped by others on the Cordevalle development site. Our review of data presented in geologic reports previously generated for the development project indicates that the bedrock faults in the site area are inactive.

6.4 Liquefaction and Seismic Settlement: Seismic shaking may induce settlement of loose, unconsolidated sediments. This can occur in unsaturated and saturated granular soils. Considering the shallow bedrock below the tank site (absence of loose or granular soils), the potential for significant seismic induced settlement or liquefaction is considered very low.

6.5 Site Preparation: Proposed grading indicated on the tank section plan (prepared by PACE, dated July 13, 1998) indicates that cuts of up to 23 feet will be required to construct the tank pad. Fills of up to about 5 feet are anticipated along the perimeter of the downslope portion of the access road. All fills should be placed as compacted engineered fill. Areas to receive fill soils should be prepared to receive these fills by stripping surface organics and loose soils, scarifying to a minimum depth of 8 inches and compacting as engineered fill. Due to organic material noted in the near surface soils, stripped soils are not considered suitable for use as fills in structural areas.

Stripped topsoil may be stockpiled and reused in landscape areas or as erosion resistant materials at the discretion of the owner or residential development architect. It should be anticipated that topsoil will settle about 1 inch per foot of thickness of stripped soils as a result of decay of organic material. Therefore, it is also preferred that stripped soils not be placed in areas which will experience frequent foot traffic. These stripped soils should be placed in out-of-way areas where the anticipated long term settlement will not pose a safety concern or require constant regrading.

Often when fill soils are placed on sloping terrain, the fill soils will migrate downhill due to gravity, with slippage occurring on the plane between the fill soils and the native subgrade. To reduce the potential for this movement, the fill soils placed on slopes steeper than 5H:1V should be prepared to receive engineered by benching and keying into the stiff and competent native soils or bedrock to reduce the potential for a failure plane between the fill soils and the native materials. Based on the native slope grades at the site and the thickness of fill soils proposed, construction of one keyway will be required prior to placement of engineered fill. Keyway or benches should be a minimum of 6 feet wide.

6.6 **Cut and Fill Slopes:** For slope stability, permanent slopes should be constructed such that both cut and fill slopes are 2H to 1V or flatter. If slopes are to be graded steeper than 2H to 1V, these slopes should be evaluated by the geotechnical engineer on a case by case basis. It is anticipated that relatively steep temporary cut slopes of about 10 feet in height will be required for construction of the concrete wall footing and french drains. Observations of test pits and soil and rock conditions suggest that near vertical cuts may be stable on a temporary bases. However, considering the weathered nature of the greenstone bedrock, temporary excavations in weathered rock should not be graded steeper than 3/4H to 1V unless evaluated by a geotechnical engineer. Temporary excavations in soils should not be graded steeper than 1H to 1V unless evaluated by a geotechnical engineer.

Run-on of surface water onto the proposed 2H to 1V cut slope could cause erosion, and increased moisture content and soil unit weight. These factors would tend to decrease the long term stability of the proposed cut slope. Accordingly, a brow ditch, should be provided to direct surface water away from the cut slope. In addition, the cut slope should be maintained and protected with proper cover, such as shallow rooted vegetation, to reduce erosion and aid in stability. If the slope is landscaped, irrigation should be drip type or one with equivalent lack of runoff.

6.7 **Tank Foundation and Bottom:** Tank wall footings are proposed at depths ranging from about 10 to 23 feet below existing site grades. Test boring and test pit data indicate that the base of the footings will be on variably weathered greenstone bedrock. Conditions at the proposed footing depths are anticipated to be predominantly competent greenstone. However, due to the irregular weathering profile, some lean clay soils are anticipated. Where lean clay soils are exposed at the bottom of foundation excavations, these soils should be excavated down to firm rock material. The excavations should be backfilled with a low-compressible engineered fill material or lean (2-sack) cement slurry to establish a level foundation bottom.

The tank walls and bottom are to be lined with a 36 mil potable Hypalon material. Considering that variable weathered soil and rock conditions are anticipated at the bottom of the tank, some differential settlement of the bottom liner may occur. Although it is anticipated that the proposed bottom liner can accommodate some differential settlement, soil materials exposed on the tank pad should be prepared to so that a relatively smooth (regular) tank bottom surface is maintained during filling and operation of the tank. Preparation should include ripping and moisture conditioning to a depth of 8 inches below pad grade and compacting soils as engineered fill. This would also provide a provide a uniform base relatively free of sharp rocks which could puncture the bottom liner. The liner manufacturer should be consulted to assess whether the site preparation recommendations are consistent with the tear resistance of the liner material.

After excavation of the tank pad, and prior to placement of footings or liner, the subgrade should be reviewed by our firm to confirm the removal of soft or pliant areas.

6.8 Corrosion Protection: The risk of corrosion of construction materials relates to the potential for soil-induced chemical reaction. The rate of deterioration depends on soil resistivity, texture, acidity, and chemical concentration. The evaluation of potential corrosion for the tank was based on the results of an analyses of a composite sample collected from the location of proposed lot 8 of the Cordevalle residential development, about 2,000 feet south of tank site. Review of soil chemical test data for similar soils in the Cordevalle project area suggest that these results represent soil chemical conditions at the subject site.

Results of the analysis indicate a resistivity value of 21,600 ohms/cm and a pH value of 6.0. These values indicate the soils are "mildly corrosive". In addition, the results of the two soil sample analyses indicated a "none-detected" concentration of sulfate (less than the detection limits of 0.01 weight percent), and a chloride concentration of 0.0013 weight percent. We recommend that these soil corrosion data be provided to the manufacturer's or supplier's of materials that will be in contact with soils (pipes or ferrous metal objects, etc.) to provide assistance in selecting the protection and materials for the proposed products or materials. If the manufacturer's or supplier's cannot determine if materials are compatible with the soil corrosion conditions, a professional consultant, i.e. a corrosion engineer, with experience in corrosion protection should be consulted to provide design parameters.

7.0 CONCLUSIONS

Based on the data collected during the field and laboratory investigations, our geotechnical experience in the vicinity of the project site, and our understanding of the anticipated construction, we present the following general conclusions.

7.1 The site is suitable for the proposed construction with regard to support of the proposed tank, foundations, and concrete slabs-on-grade, provided the recommendations contained in this report are followed. It should be noted that the recommended design consultation and construction monitoring by Twining are integral to this conclusion.

7.2 The soil/rock conditions encountered comprised silty sands to depths of about 1 to 2 feet BSG, underlain by lean clay to a depth of 5 to 7 feet BSG. Weathered greenstone bedrock was encountered below the lean clay to the maximum depth of exploration of 41.5 feet BSG.

7.3 Field data suggests that some shallow groundwater may occur near the tank pad elevation. The proposed french drain appears adequate to provide subsurface drainage away the wall foundation (retaining wall).

7.4 After excavation of the tank pad, and prior to placement of footings or liner, the subgrade should be reviewed by our firm to confirm the removal of soft or pliant areas.

7.5 The bottom of the tank may be supported on hard greenstone, on low compressive engineered fill, or on a 2-sack sand cement slurry extending to hard greenstone rock (slurry required to fill areas of overexcavated highly weathered greenstone).

7.6 The tank pad should be prepared by moisture conditioning and compacting exposed native soils as engineered fill to a depth of 8 inches.

7.7 Total and differential settlements for the proposed tank are estimated to be 1 inch or less.

7.8 The potential for liquefaction and seismic settlement are very low based on the absence of granular soils at the site.

7.9 Proposed permanent slopes of 2H to 1V or flatter are anticipated to remain stable during the design life of the structure. If permanent slopes are to be graded steeper than 2H to 1V, these should be evaluated by the geotechnical engineer on a case by case basis. Temporary excavations in lean clay or silty sand soils should not be graded steeper than 1H to 1V. Temporary excavations in weathered rock should not be graded steeper than 3/4H to 1V, unless evaluated by a geotechnical engineer.

7.10 The analytical result of a soil sample analysis indicates that the near-surface soils exhibit a "mildly corrosive" corrosion potential to buried metal objects.

7.11 The analytical result of a soil sample analyses indicate sulfate concentrations of "none detected" and a chloride concentration of 0.0013 percent by dry weight. Therefore, a low potential for sulfate attack on reinforced concrete placed in the near-surface soils is anticipated.

8.0 RECOMMENDATIONS

Based on the evaluation of the field and laboratory data and our geotechnical experience in the vicinity of the project, we present the following recommendations for use in the project design and construction. However, this report should be considered in its entirety. When applying the recommendations for design, the background information, procedures used, findings, evaluation, and conclusions should be considered. The recommended design consultation and construction monitoring by Twining are integral to the proper application of the recommendations.

8.1 Site Grading and Drainage

8.1.1 Develop and maintain site grades which will drain surface runoff away from the tank walls - both during and after construction. Adjacent exterior finished grades should be sloped a minimum of two percent for a distance of at least five feet away from the tank to preclude ponding of water adjacent to the tank.

8.1.2 Landscaping after construction should direct rainfall and irrigation runoff away from the structure and not promote ponding of water adjacent to the structures. Care should be taken to maintain a leak-free sprinkler system.

8.2 Site Preparation

8.2.1 All topsoil, vegetation, organics, and debris should be removed from the proposed tank and roadway areas. The general depth of stripping should be sufficiently deep to remove the root systems and organic topsoils. For estimate purposes, a minimum stripping depth of 6 inches should be used. The actual depth of stripping should be reviewed by our firm at the time of construction. Deeper stripping may be required in localized areas. Stripping should extend laterally a minimum of 5 feet outside the tank and roadway perimeters. These materials will not be suitable for use as engineered fill; however, stripped topsoil may be stockpiled and reused in landscape areas at the discretion of the owner. It should be anticipated that topsoil will settle about 1 inch per foot of thickness as a result of decay of organic material.

8.2.2 We anticipate that the pad will be cut to a maximum depth of about 23 feet to achieve the designed tank bottom surface. This excavation would remove the loose near surface silty sand soils. Along the perimeter of the pad (where fill is to be placed) care should be taken to remove the loose silty sand soils to a minimum depth of 1 foot BSG prior to placement of the fill.

8.2.3 If fill soils are to be placed on slopes steeper than 5H:1V the slopes should be prepared to receive engineered keying into the stiff and competent native soils or bedrock at the to of the fill slope.

8.2.4 After stripping, excavation of the tank pad, and prior to placement of engineered fill, the subgrade should be reviewed by Twining to confirm the removal of topsoil, organics, and soft or pliant areas.

8.2.5 The bottoms of keyways and footings should be reviewed by Twining prior to placement of overlying materials.

8.2.6 The exposed ground surface in areas to receive engineered fill material should be scarified to a depth of 8 inches, moisture conditioned in accordance with subsection 8.3.1, and compacted as engineered fill. The zone of scarification and compaction should extend laterally a minimum of 5 feet outside the perimeters of the fill area. The scarification and compaction should be conducted following stripping operations, removal of subsurface structures, over-excavation, and removal of all soft or pliant areas.

8.2.7 All fill required to bring the site to final grade should be placed as engineered fill. In addition, all native soils over-excavated should be compacted on-site as engineered fill.

8.3 Engineered Fill

8.3.1 All fills should be placed as compacted engineered fill. The on-site soils and rock encountered are predominantly silty sands, lean clays, and weathered greenstone. The silty sand and lean clay soils will be suitable for use as fill material to support the structural loads, provided they are free of organics and debris and the moisture content of the soil is two to five percent over optimum moisture content at the time of placement for the lean clays, or within 2 percent of optimum for the sandy soils. If soils other than those considered in this report are encountered, Twining should be notified to provide alternate recommendations. If the near surface silty sand soils are used, these soils should be moisture conditioned to within two percent of optimum moisture and compacted as engineered fill.

8.3.2 The compactability of the native soils is dependent upon the moisture contents, subgrade conditions, degree of mixing, type of equipment, as well as other factors. The evaluation of such factors was beyond the scope of this report; therefore, we recommend that they be evaluated by the contractor during preparation of bids and construction of the project.

8.3.3 Engineered fill soil should be placed in loose lifts approximately 8 inches thick, moisture-conditioned to 2 to 5 percent above optimum, and compacted to a dry density of at least 90 percent of the maximum dry density as determined by ASTM Test Method D1557-78. Additional lifts should not be placed if the previous lift did not meet the required dry density or if soil conditions are not stable.

8.3.4 Backfill material behind the tank wall should be non-expansive sandy soils or crushed rock material. These non-expansive materials will have good draining characteristics. If an open graded material is used in the french drain, a filter fabric such as Mirifi 140NS should separate the drain material from the finer grained fill material to minimize mixing and volume losses.

8.4 <u>Tank Foundation and Bottom</u>

8.4.1 Structural loads from the tank may be supported on either a ring foundation, strip footings, or on gravel or sand over the native subgrade. Ring or strip foundations should be supported on a minimum of 12 inches of engineered fill. Spread and continuous footings, a minimum of 1 foot deep and 1 foot wide, may be designed for a maximum gross allowable soil bearing pressure of 3,000 pounds per square foot for dead-plus-live loads. Gross allowable soil bearing pressure is the maximum contact pressure at the base of the foundations. These values may be increased by one-third for short duration wind or seismic loads.

8.4.2 A structural engineer experienced in perimeter foundation design for tanks should recommend the reinforcement, thickness, design details and concrete specifications for the tank foundation.

8.4.3 A total settlement of 1 inch should be anticipated for design. A differential settlement of 1 inch from the center to edge of the tank should also be anticipated for design.

8.4.4 The tank bottom subgrade should be prepared by moisture conditioning and compacting soils as engineered fill to a depth of 8 inches.

8.4.5 The tank connections to exterior structures and pipelines should be designed with flexible connections such that a minimum of 2 inches of settlement can occur without causing damage (more than the predicted settlements to allow for variances in the actual settlement).

8.5 Frictional Coefficient and Earth Pressures

8.5.1 The bottom surface area of concrete footings or concrete slabs in direct contact with engineered fill can be used to resist lateral loads (areas of slabs underlain by a synthetic moisture barrier cannot be considered). An ultimate coefficient of friction of 0.36, reduced by an appropriate factor of safety, can be used for design.

8.5.2 The ultimate passive resistance of the native soils and engineered fill may be assumed to be equal to the pressure developed by a fluid with a density of 300 pounds per cubic foot. An appropriate factor of safety should be applied.

8.5.3 The passive pressure was calculated based on a minimum soil unit weight of 100 pounds per cubic foot. The soils within the passive zone at the foot of retaining walls (one footing width in front of the wall to a depth equal to the footing depth) should be tested to verify that the soils have the minimum unit weight of 100 pounds per cubic foot (with moisture). If the soils have a unit weight of less than 100 pounds per cubic foot, the soils within this zone should be over-excavated and replaced as engineered fill. These soils should be tested prior to backfilling behind the wall.

8.5.4 A minimum factor of safety of 1.5 should be used for the lateral resistance, or as required by the governing building codes. The frictional and passive resistance of the soil may be combined in determining the total lateral resistance. The upper 12 inches of subgrade should be neglected in determining the total passive resistance.

8.5.5 The active and at-rest pressures of the native soils and engineered fill may be assumed to be equal to the pressures developed by a fluid with a density of 43 and 65 pounds per cubic foot, respectively. These pressures assume level ground surface and do not include the surcharge effects of construction equipment, loads imposed by nearby foundations and roadways and hydrostatic water pressure.

8.5.6 The active and at-rest pressures were calculated based on a maximum soil unit weight of 130 pounds per cubic foot. The compacted soils behind the retaining walls should not have a compacted unit weight above 130 pounds per cubic foot (with moisture). If the soils have a unit weight of greater than 130 pounds per cubic foot, the soils should be over-excavated and replaced at a lower degree of compaction. If the backfill soils must be placed at a unit weight of over 130 pounds per cubic foot to achieve minimum compaction requirements the material should not be used as backfill behind retaining walls.

8.5.7 The at-rest pressure should be used in determining lateral earth pressures against walls which are not free to deflect. For walls which are free to deflect at least one percent of the wall height at the top, the active earth pressure may be used.

8.6 Temporary Excavations

8.6.1 It is the responsibility of the contractor to provide safe working conditions with respect to excavation slope stability.

8.6.2 Temporary excavations should be constructed in accordance with CALOSHA requirements. Temporary cut slopes in weathered rock should not be steeper than 3/4H to 1V, and flatter if possible. Temporary cut slopes in lean clay or silty sand soils should not be steeper than 1H to 1V. If excavations can not meet this criteria, the temporary excavations should be shored.

8.6.3 Shoring systems, if used, should be designed by an engineer with experience in designing shoring systems and registered in the State of California.

8.7 Utility Trenches

8.7.1 The type of pipe bedding, the initial backfill and compaction requirements of bedding and initial backfill material should be specified by the project Civil Engineer based on either the manufacturers requirements, or ASTM D-2321 for flexible polyvinylchloride (PVC) pipe, whichever is more stringent.

8.7.2 Utility trench backfill placed in or adjacent to building areas, exterior slabs or pavements should be moisture conditioned to within two percent of the optimum moisture content and compacted to at least 92 percent of the maximum dry density as determined by ASTM Test Method D1557-78. The contractor should use appropriate equipment and methods to avoid damage to utilities and/or structures during placement and compaction of the backfill materials.

8.7.3 When utility trench backfills are determined by Twining to be nonstructural backfills, they should be compacted to a minimum of 90 percent of the maximum dry density as determined by ASTM Test Method D1557-78.

8.7.4 Trench backfill should be placed in 8 inch lifts, moisture conditioned to within 2 percent of optimum and compacted to achieve the minimum relative compaction. Lift thickness can be increased if contractor can demonstrate the minimum compaction requirements can be achieved.

8.7.5 On-site soils and approved imported engineered fill may be used as final backfill in trenches.

8.7.6 Jetting of trench backfill is not recommended to compact the backfill soils.

8.8 Cut and Fill Slopes

8.8.1 For stability, permanent fill and cut slopes should be constructed at 2H to 1V, or flatter.

8.8.2 Where fill is placed on native slopes steeper than 5H to 1V, a minimum 6 foot wide keyway should be constructed at the toe of fill slopes.

8.8.3 Based on the nature of the slopes in the vicinity of the tank pad a minimum setback of 20 feet should be sufficient. This setback could be adjusted based on our review of the final grading plans. The setback should be measured between the bottom of the tank foundation, horizontally to the slope face.

8.8.4 Develop and maintain site grades which will drain surface and roof runoff away from the slopes both during and after construction.

8.8.5 The slopes should be graded to promote sheet type flow. Brow ditches should be constructed at the top of the cut slope to intercept potential runon water and channel it away from the slope faces.

8.8.6 A shallow rooted ground cover type of vegetation should be planted on the slopes to prevent erosion and aid in stability. Areas particularly susceptible to erosion and not amenable to successful vegetation should be protected with other techniques such as the use of jute netting or geotextile erosion control mats. Irrigation should be of a drip type or micro sprinkler system which does not generate surface runoff.

8.8.7 During earthwork operations, keyways should be observed by our firm to determine if the subsurface conditions are compatible with those used in our evaluation and design.

8.9 Corrosion Protection

8.9.1 Based on the ASTM Special Technical Publication 741 and the analytical results of a near surface soil sample, the soils range are "mildly corrosive". Buried metal objects should be protected in accordance with the manufacturer's recommendations based on a "corrosive" corrosion potential of the soil. The evaluation was limited to the effects of soils to metal objects; corrosion due to other potential sources, such as stray currents and groundwater, was not evaluated.

8.9.2 Corrosion of concrete due to sulfate attack is not anticipated based on concentration of sulfates indicating negligible exposure, as determined for the near-surface soils. Type I or II cement may be used as specified in Table No. 19-A-3 of the 1994 Uniform Building Code.

8.9.3 We recommend that these soil corrosion data be provided to the manufacturer's or supplier's of materials that will be in contact with soils (pipes or ferrous metal objects, etc.) to provide assistance in selecting the protection and materials for the proposed products or materials. If the manufacturer's or supplier's cannot determine if materials are compatible with the soil corrosion conditions, a professional consultant, i.e. a corrosion engineer, with experience in corrosion protection should be consulted to design parameters.

9.0 DESIGN CONSULTATION

9.1 Twining should be provided the opportunity to review those portions of the contract drawings and specifications that pertain to earthwork and foundations prior to finalization to determine whether they are consistent with our recommendations. This service is part of this current contractual agreement.

9.2 It is the client's responsibility to provide plans and specification documents for our review prior to their issuance for construction bidding purposes.

9.3 If Twining is not afforded the opportunity for review, we assume no liability for the misinterpretation of our conclusions and recommendations. This review is documented by a formal plan/specification review report provided by Twining.

10.0 CONSTRUCTION MONITORING

10.1 It is recommended that Twining be retained to observe the excavation, earthwork, and foundation phases of work to determine that the subsurface conditions are compatible with those used in the analysis and design.

10.2 Twining can conduct the necessary observation, field testing services and provide results so that action necessary to remedy indicated deficiencies can be taken in accordance with the plans and specifications. Upon completion of the work, we will provide a written summary of our observations, field testing and conclusions regarding the conformance of the completed work to the intent of the plans and specifications. This service is not, however, part of this current contractual agreement.

10.3 The construction monitoring is an integral part of this investigation. This phase of the work provides Twining the opportunity to verify the subsurface conditions interpolated from the soil test pits and make alternative recommendations if the conditions differ from those anticipated.

10.4 If Twining is not afforded the opportunity to provide engineering observation and field testing services during construction activities related to earthwork, foundations, pavements and trenches; then, Twining will not be responsible for compliance of any aspect of the construction with our recommendations or performance of the structures or improvements if the recommendations of this report are not followed. We recommend that if a firm other than Twining is selected to conduct these services that they provide evidence of professional liability insurance of at least $1,000,000 and review this report. After their review, the firm should, in writing, state that they understand and agree with the conclusions and recommendations of this report and agree to conduct sufficient observations and testing to ensure the construction complies with this report's recommendations. Twining should be notified, in writing, if another firm is selected to conduct observations and field testing services prior to construction.

10.5 Upon the completion of work, a final report should be prepared by Twining per the requirements of the Uniform Building Code, Chapter 33A, "Excavation and Grading," Section 3318.1, "Final Reports". This report is essential to ensure that the recommendations presented are incorporated into the project construction, and to note any deviations from the project plans and specifications. The client should notify Twining upon the completion of work to provide this report. This service is not, however, part of this current contractual agreement.

11.0 NOTIFICATION AND LIMITATIONS

11.1 The conclusions and recommendations presented in this report are based on the information provided regarding the proposed construction, and the results of the field and laboratory investigation, combined with interpolation of the subsurface conditions between test pit locations.

11.2 The nature and extent of subsurface variations between test pits may not become evident until construction.

11.3 If variations or undesirable conditions are encountered during construction, Twining should be notified promptly so that these conditions can be reviewed and our recommendations reconsidered where necessary. It should be noted that unexpected conditions frequently require additional expenditures for proper construction of the project.

11.4 If the proposed construction is relocated or redesigned, or if there is a substantial lapse of time between the submission of our report and the start of work (over 12 months) at the site, or if conditions have changed due to natural cause or construction operations at or adjacent to the site, the conclusions and recommendations contained in this report should be considered invalid unless the changes are reviewed and our conclusions and recommendations modified or approved in writing.

11.5 Changed site conditions, or relocation of proposed structures, may require additional field and laboratory investigations to determine if our conclusions and recommendations are applicable considering the changed conditions or time lapse.

11.6 The conclusions and recommendations contained in this report are valid only for the project discussed in Section 3.4, Proposed Construction. The use of the information and recommendations contained in this report for structures on this site not discussed herein or for structures on other sites not discussed in Section 3.3, Site Description is not recommended. The entity or entities that use or cause to use this report or any portion thereof for another structure or site not covered by this report shall hold Twining, its officers and employees harmless from any and all claims and provide Twining's defense in the event of a claim.

11.7 This report is issued with the understanding that it is the responsibility of the client to transmit the information and recommendations of this report to developers, owners, buyers, architects, engineers, designers, contractors, subcontractors, and other parties having interest in the project so that the steps necessary to carry out these recommendations in the design, construction and maintenance of the project are taken by the appropriate party.

11.8 This report presents the results of a geotechnical engineering investigation only and should not be construed as an environmental audit or study.

11.9 Our professional services were performed, our findings obtained, and our recommendations prepared in accordance with generally-accepted engineering principles and practices in Santa Clara County as of June 1998. This warranty is in lieu of all other warranties either expressed or implied.

11.10 Reliance on this report by a third party (i.e., that is not a party to our written agreement) is at the party's sole risk. If the project and/or site is purchased by another party, the purchaser must obtain written authorization and sign an agreement with Twining in order to rely upon the information provided in this report for design or construction of the project.

We appreciate the opportunity to be of service to Lion's Gate Estate Partners, LLC. If you have any questions regarding this report, or if we can be of further assistance, please contact us at your convenience.

Sincerely,
THE TWINING LABORATORIES, INC.

REGISTERED GEOLOGIST
KENNETH JAMES CLARK
No. EG 1864
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA
Exp 5-31-99

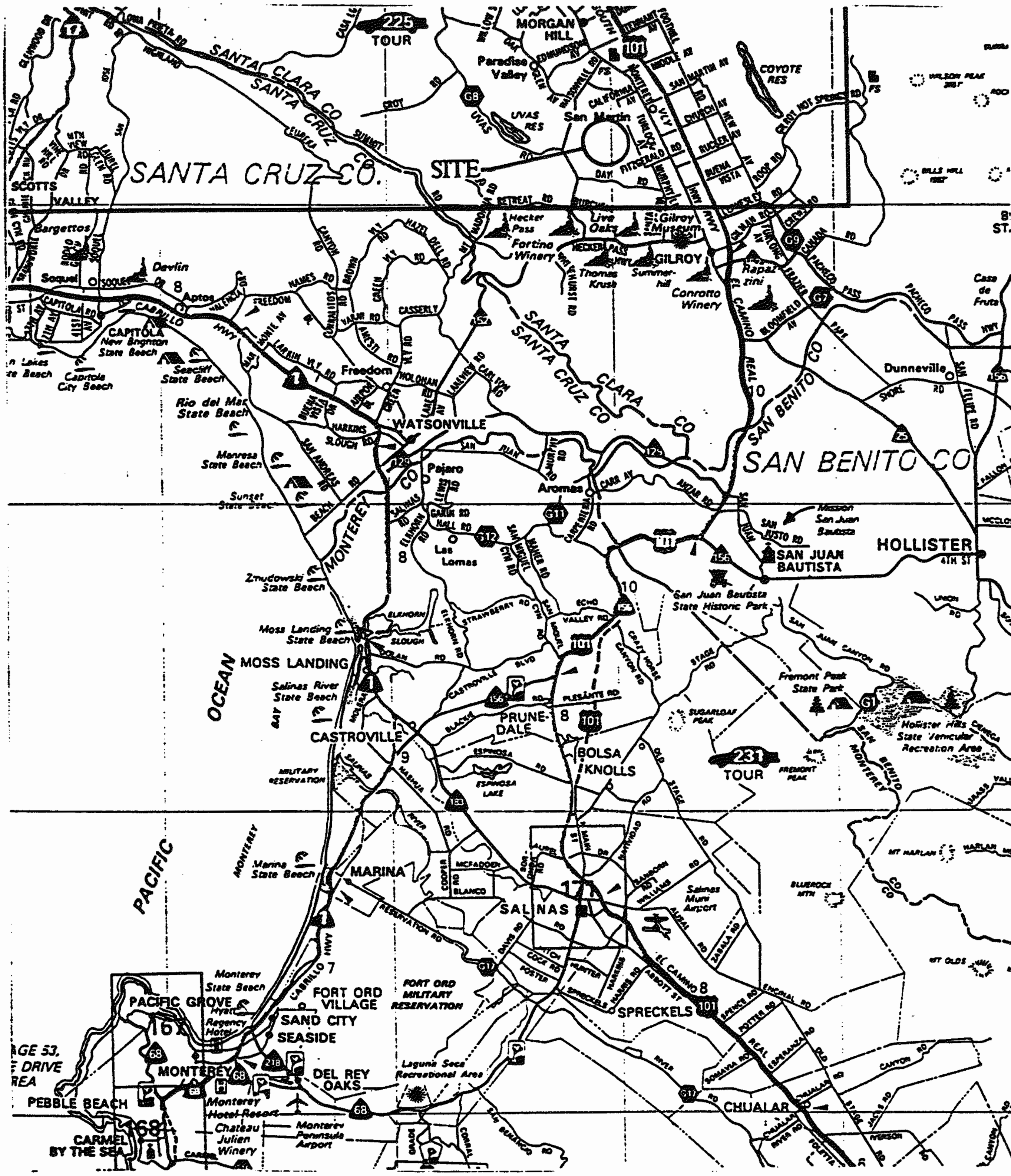
Kenneth J. Clark, CEG
Engineering Geologist
Geotechnical Engineering Division

REGISTERED PROFESSIONAL ENGINEER
SCOTT KRAUTER
No. GE2358
Exp. 12/31/00
GEOTECHNICAL
STATE OF CALIFORNIA

Scott W. Krauter, RCE, RGE
Manager
Geotechnical Engineering Division

APPENDIX A

DRAWINGS



SITE LOCATION MAP CORDEVALLE GOLF CLUB & HOTEL SAN MARTIN, CALIFORNIA	FILE NO.: 34301-02*	DATE: 8-11-98	THE TWINING LABORATORIES, INC. EST.1898 FRESNO/MODESTO/VISALIA/BAKERSFIELD/SALINAS
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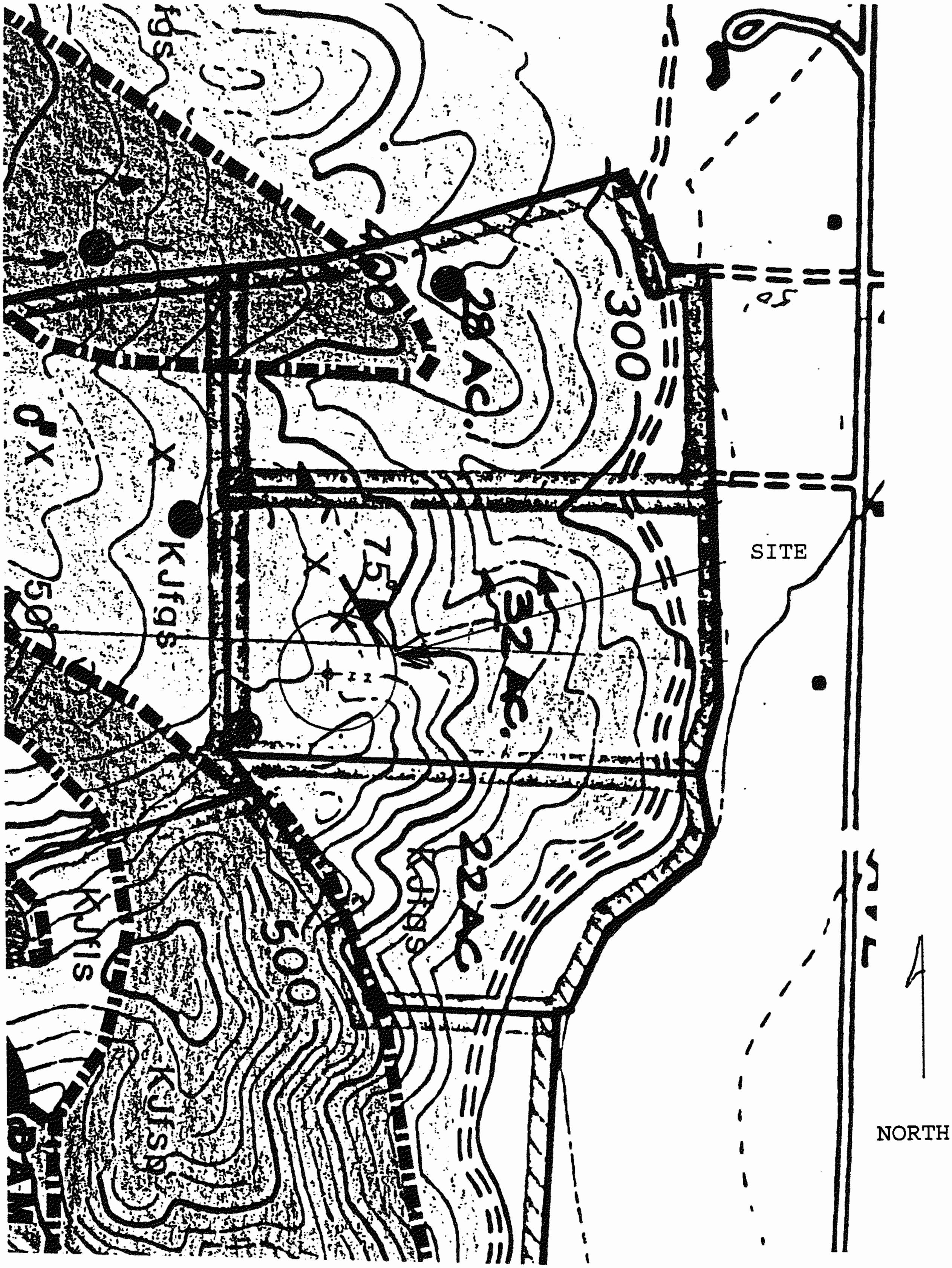
	PROJECT NO. D34301.02	DRAWING NO. 1	



TEST BORING

TEST PIT

SCALE: 1" = 500'

SITE PLAN WITH TEST BORING & TEST PIT LOCATIONS CORDEVALLE GOLF CLUB & HOTEL SAN MARTIN, CALIFORNIA	FILE NO.: 34301-02•	DATE: 8-11-98	THE TWINING LABORATORIES, INC. EST. 1898 FRESNO/MODESTO/VISALIA/BAKERSFIELD/SALINAS
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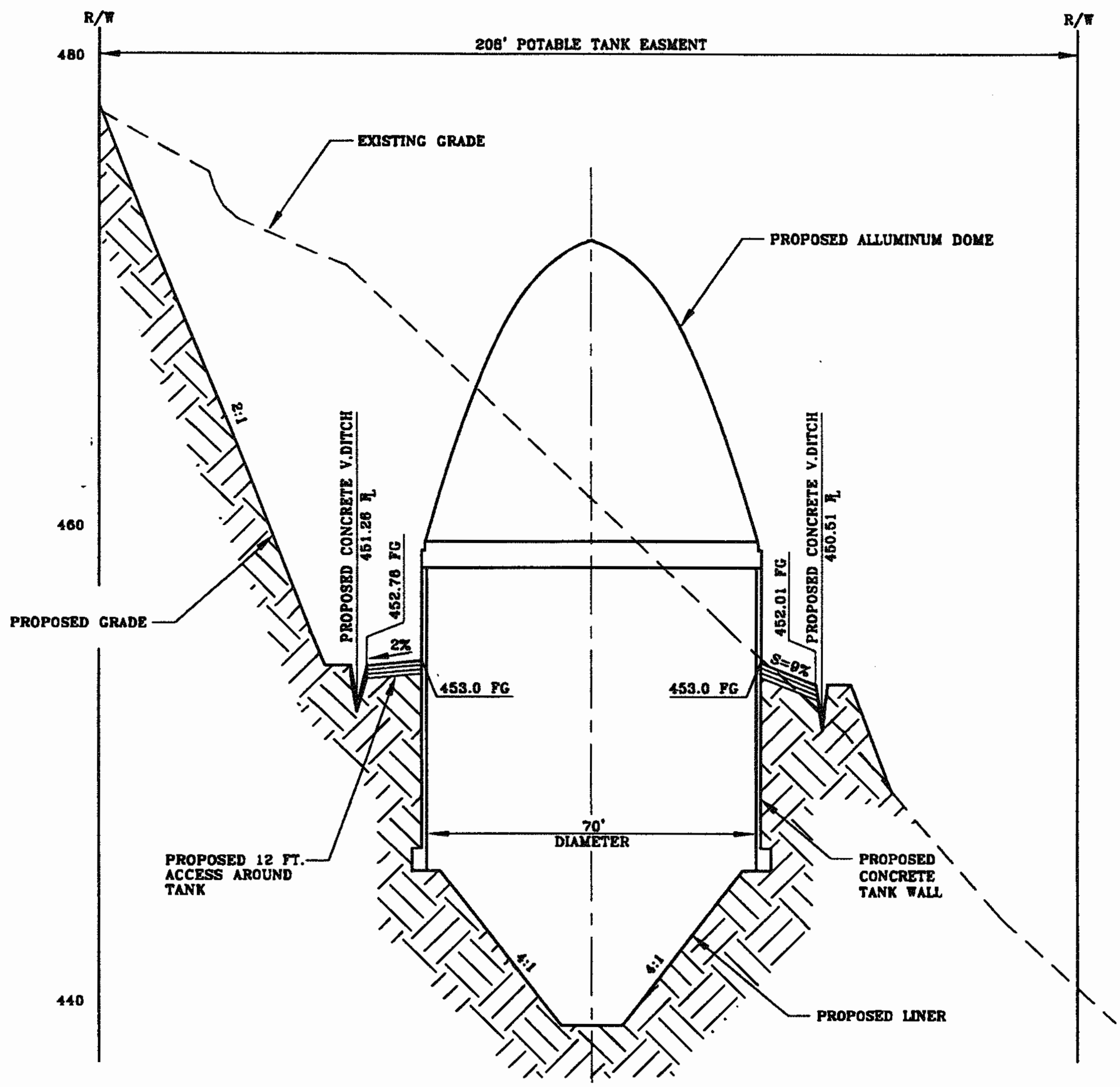
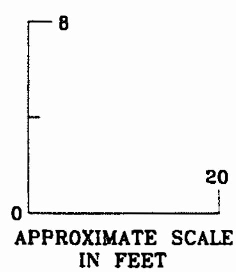
	PROJECT NO. D34301.02	DRAWING NO. 2	



TANK CROSS SECTION



TANK CROSS SECTION CORDEVALLE GOLF CLUB & HOTEL SAN MARTIN, CALIFORNIA	FILE NO.: 34301-02*	DATE: 8-10-98	THE TWINING LABORATORIES, INC. EST.1898 FRESNO/MODESTO/VISALIA/BAKERSFIELD/SALINAS
	DRAWN BY: PNG	APPROVED BY: RLC	
	PROJECT NO. D34301.02	DRAWING NO. 3	

APPENDIX B

LOG OF TEST BORINGS AND PITS

This appendix contains the final logs of borings. These logs represent our interpretation of the contents of the field logs and the results of the field and laboratory tests.

The boring logs and related information depict subsurface conditions only at these locations and at the particular time designated on the logs. Soil conditions at other locations may differ from conditions occurring at these test boring locations. Also, the passage of time may result in changes in the soil conditions at these test boring locations.

In addition, an explanation of the abbreviations used in the preparation of the logs and a description of the Unified Soil Classification System are provided at the end of Appendix B.

THE TWINING LABORATORIES, INC. EST. 1898

SOIL TEST BORING SYMBOLIC LOG

BORING B-1

Project: Cordevalle Potable Water Tank
Project Number: TL D34301.02A
Location: San Martin, CA
Date: 07/07/98
Logged By: M. Sekhon
Elevation: n/a
Drilled By: T. Conley
Depth to Groundwater: NE
Drill Type: CME 75
Cased to Depth: n/a
Auger Type: 6-5/8" OD HSA
Hammer Type: CME Trip

ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Soil Description	Remarks	N-value	Moisture Content %
0		SM	SAND, Silty with gravels; very dense, slightly moist, fine-grained, light brown			
	17/6 25/6 32/6	CL	LEAN CLAY with gravels; hard, slightly moist, low plasticity, brown gravel fraction increase		57	2
5	50/5		weathered greenstone, very dense, damp, pale olive	DD = 125.7 pcf $\phi = 28°$ c = 369 psf	> 100	2
10	5/6 50/5				> 100	4
15	28/6 40/2.5				> 100	3
20	10/6 33/6 26/6		stiffness decrease, moisture increase, gravel fraction decrease		59	5
25	11/6 29/6 20/1				> 100	2
30	7/6 12/6 22/6				34	

Notes: *Approximately 120 feet west of edge of tank.*

Figure Number B-1

THE TWINING LABORATORIES, INC.

EST. 1898

SOIL TEST BORING SYMBOLIC LOG

BORING B-1

Project: Cordevalle Potable Water Tank
Project Number: TL D34301.02A

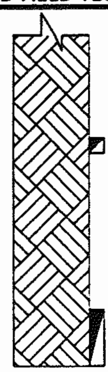
Location: San Martin, CA
Date: 07/07/98

Logged By: M. Sekhon
Elevation: n/a

Drilled By: T. Conley
Depth to Groundwater: NE

Drill Type: CME 75
Cased to Depth: n/a

Auger Type: 6-5/8" OD HSA
Hammer Type: CME Trip



ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Soil Description	Remarks	N-value	Moisture Content %
35	50/5		water content increase, wet soil		> 100	
40	24/6 30/6 46/6				76	
			Bottom of Boring			
45						
50						
55						
60						
65						

Notes: *Approximately 120 feet west of edge of tank.*

Figure Number B-1

SOIL TEST BORING SYMBOLIC LOG

THE TWINING LABORATORIES, INC. EST. 1898

BORING TP-1

Project: Cordevalle Potable Water Tank	**Project Number:** TL D34301.02A
Location: San Martin, CA	**Date:** 07/07/98
Logged By: K. Clark	**Elevation:** n/a
Drilled By: n/a	**Depth to Groundwater:** NE
Drill Type: Backhoe	**Cased to Depth:** n/a
Auger Type: n/a	**Hammer Type:** n/a

ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Soil Description	Remarks	N-value	Moisture Content %
0		SM	SAND, Silty; damp, brown to yellow brown, rootlets and desication cracks			5
		CL	LEAN CLAY, Sandy; moist, coarse sand with scattered gravel, moderate plasticity, reddish brown			13
5			Weathered rock, greenstone, highly weathered zones are silty clay, low plasticity, pale olive, very hard digging for backhoe at 9.5 feet below site grade			4
10			Bottom of Test Pit			
15						
20						
25						
30						

Notes: *Center of proposed tank.*

Figure Number B-2

SOIL TEST BORING SYMBOLIC LOG

THE TWINING LABORATORIES, INC. EST. 1898

BORING TP-2

Project: Cordevalle Potable Water Tank
Project Number: TL D34301.02A

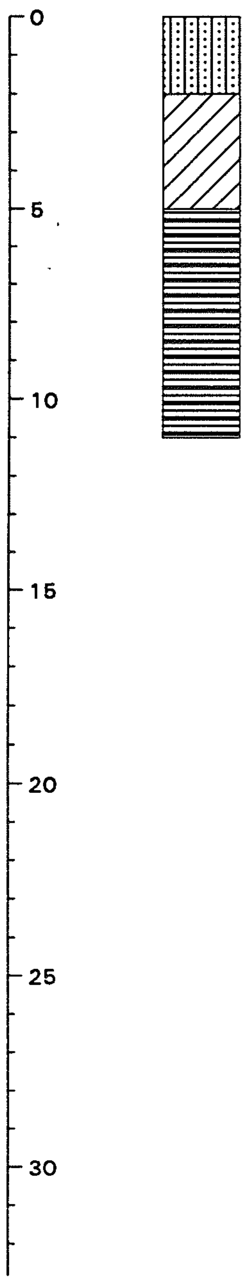
Location: San Martin, CA
Date: 07/07/98

Logged By: K. Clark
Elevation: n/a

Drilled By: n/a
Depth to Groundwater: NE

Drill Type: Backhoe
Cased to Depth: n/a

Auger Type: n/a
Hammer Type: n/a



ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Soil Description	Remarks	N-value	Moisture Content %
		SM	SAND, Silty; damp, yellow brown, fine sand with some gravel, roots and desication cracks			
		CL	LEAN CLAY, gravelly; moist, reddish brown			
			Weathered rock, greenstone, highly weathered zones are silty clay, low plasticity, pale olive, hard digging with backhoe at 6' below site grade			
			Bottom of Test Pit			

Notes: *75 feet east of center of proposed tank location.*

Figure Number B-3

KEY TO SYMBOLS

Symbol	Description
Strata symbols	
	SAND, Silty (SM)
	LEAN CLAY (CL)
	Basalt (or generic rock)
	Weathered Rock
Misc. Symbols	
	Boring continues
Soil Samplers	
	Standard penetration test
	California Modified split barrel ring sampler

Notes:

1. Test borings were drilled on 07/07/98 using a Backhoe equipped with n/a.
2. Groundwater was not encountered during drilling operations.
3. Boring locations were located by measuring wheel with reference to .
4. These logs are subject to the limitations, conclusions, and recommendations in this report.
5. Results of tests conducted on samples recovered are reported on the logs. Abbreviations used are:

DD	= Natural dry density	LL	= Liquid limit (%)
UC	= Unconfined compression (psf)	PI	= Plasticity index (%)
-4	= Percent passing #4 sieve (%)	pH	= Soil pH
-200	= Percent passing #200 sieve (%)	SS	= Soluble sulfates (%)
SR	= Soil resistivity (ohm-cm)	Cl	= Soluble chlorides (%)
c	= Cohesion (psf)	ϕ	= Angle of internal friction (degrees)
TS	= Field Torvane Shear Strength test (tsf)	NE	= None Encountered
ND	= None Detected		

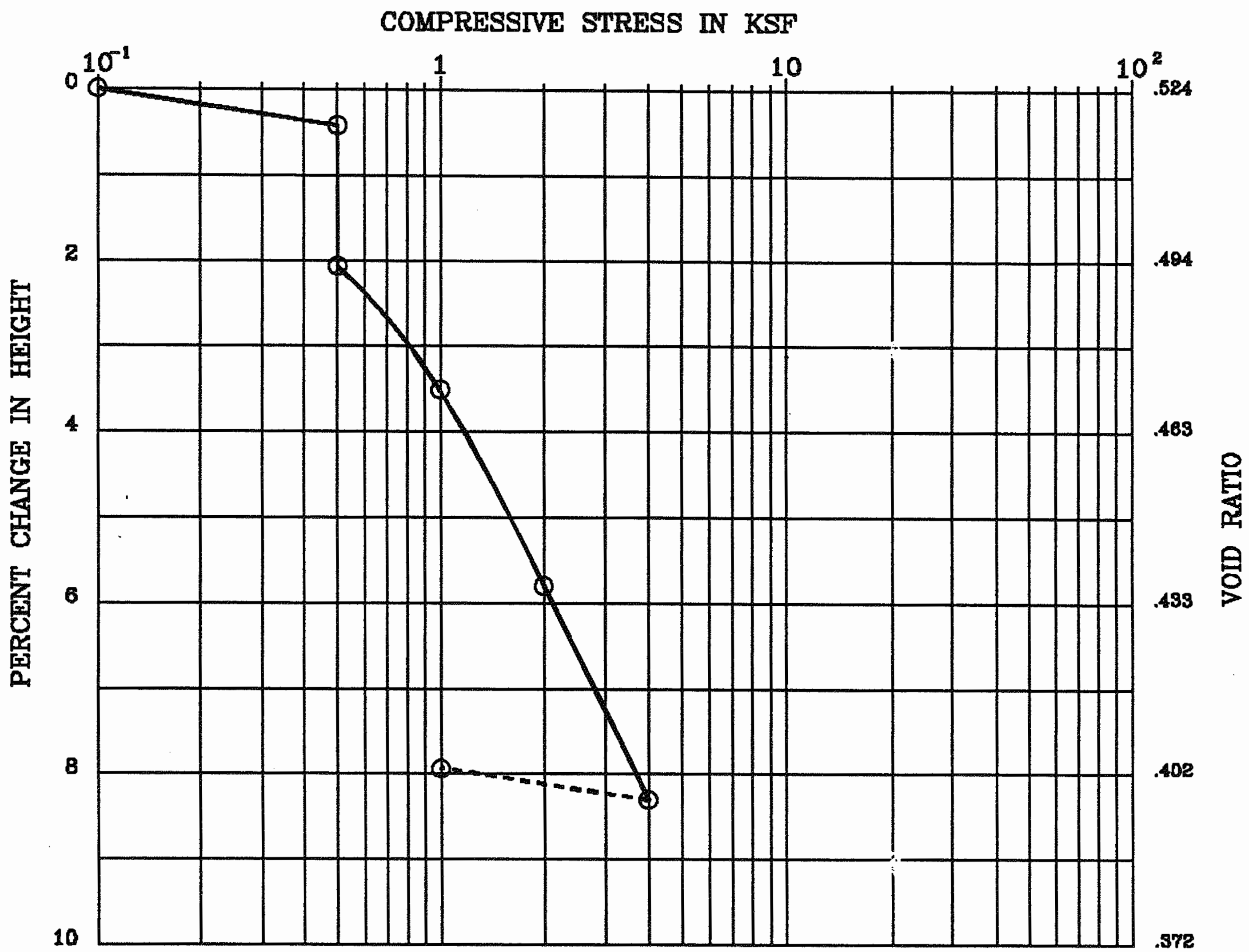
APPENDIX C

RESULTS OF LABORATORY TESTS

This appendix contains the individual results of the following tests. The results of the moisture content and dry density tests are included on the test boring logs in Appendix B. These data, along with the field observations, were used to prepare the final test boring logs in Appendix B.

These Included:	Number of Tests:	To Determine:
Natural Moisture (ASTM D2216)	9	Moisture contents representative of field conditions at the time the sample was taken.
Natural Density (ASTM D2216)	1	Dry unit weight of sample representative of in-situ or in-place undisturbed condition.
Direct Shear (ASTM D3080)	1	Soil shearing strength under varying loads and/or moisture conditions.
Consolidation (ASTM D2435)	1	The amount and rate at which a soil sample compresses when loaded, and the influence of saturation on its behavior.
Moisture-Density Relationship (ASTM D1557)	1	The optimum (best) moisture content for compacting soil and the maximum dry unit weight (density) for a given compactive effort.

These Included:	Number of Tests:	To Determine:
Sulfate Content (ASTM D4327)	1	Percentage of water-soluble sulfate as (SO_4) in soil samples. Used as an indication of the relative degree of sulfate attack on concrete and for selecting the cement type.
Chloride Content (ASTM D4327)	1	Percentage of soluble chloride in soil. Used to evaluate the potential attack on encased reinforcing steel.
Resistivity (ASTM D1125)	1	The potential of the soil to corrode metal.
pH (ASTM D4972)	1	The acidity or alkalinity of subgrade material.

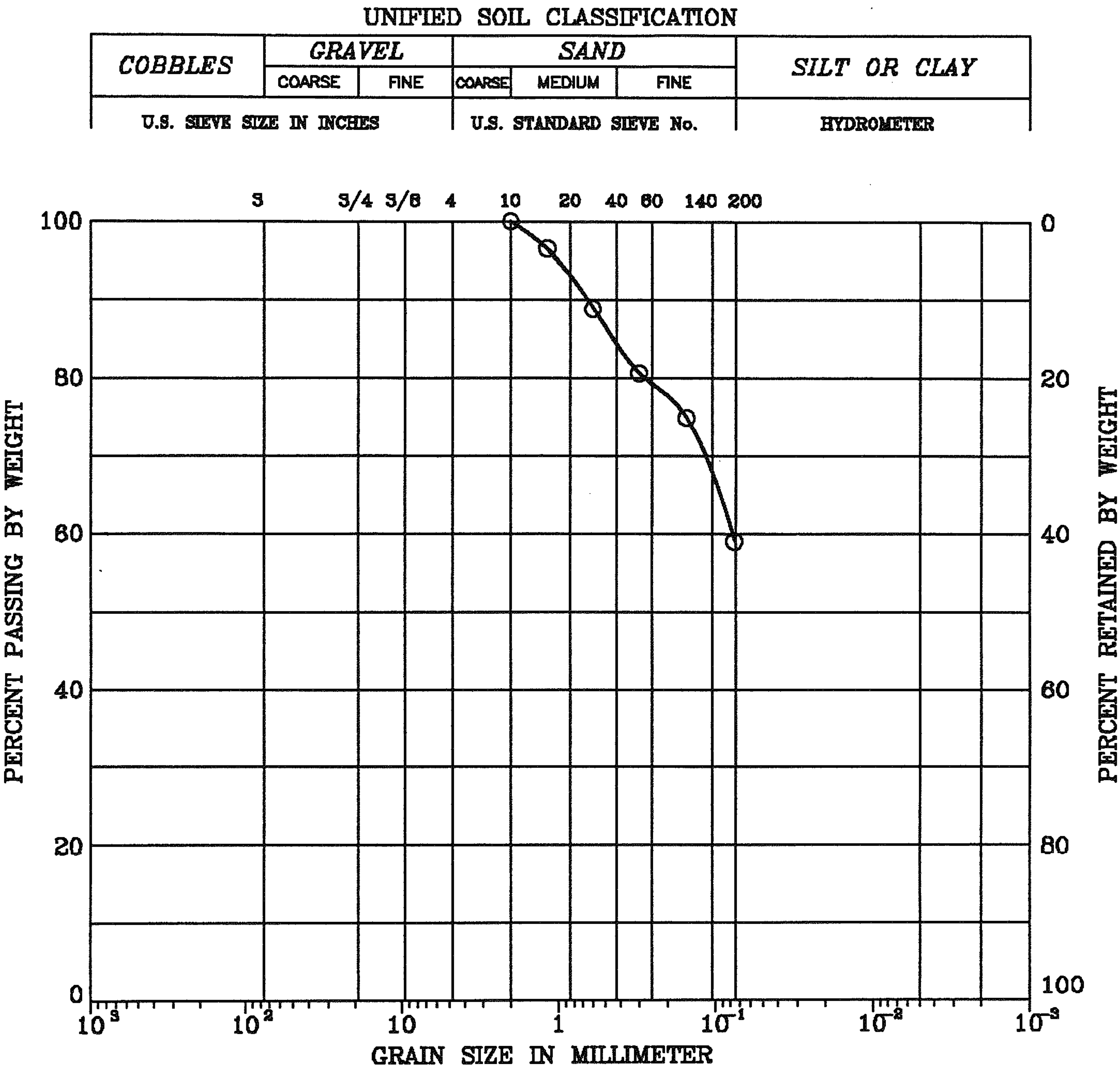


BORING	:	B-1	DESCRIPTION	:	
DEPTH (ft)	:	5.0-5.5	LIQUID LIMIT	:	
SPEC. GRAVITY	:	2.73	PLASTIC LIMIT	:	

	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	PERCENT SATURATION	VOID RATIO
INITIAL	12.7	110.7	64	.524
FINAL	15.3	120.2	100	.404

Remark : TEST METHOD: ASTM D2435 MOISTURE INCREASE AT 0.5 KSF

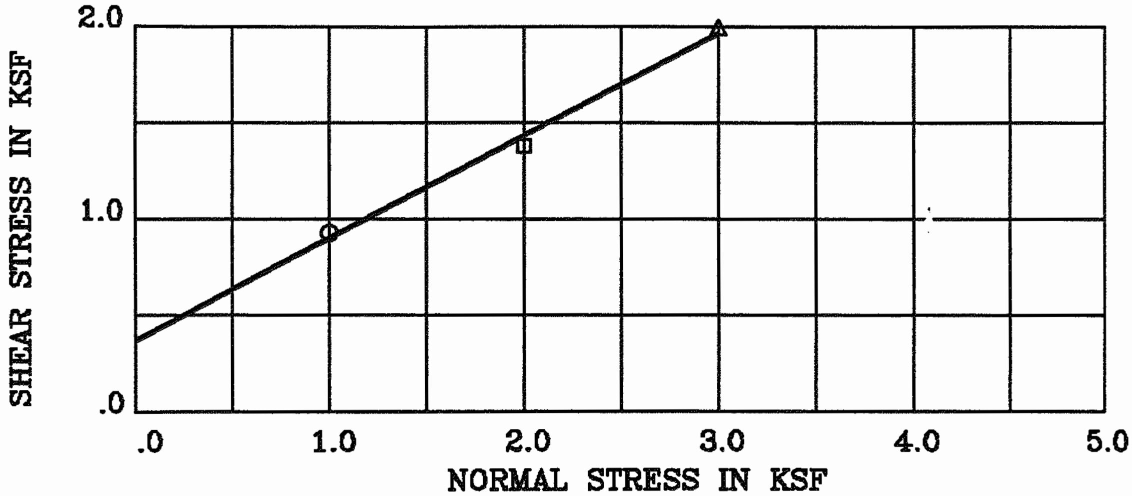
D34301.02	PROPOSED WATERTANK
The Twining Labs Inc. Fresno, CA	CONSOLIDATION TEST Figure No. 1

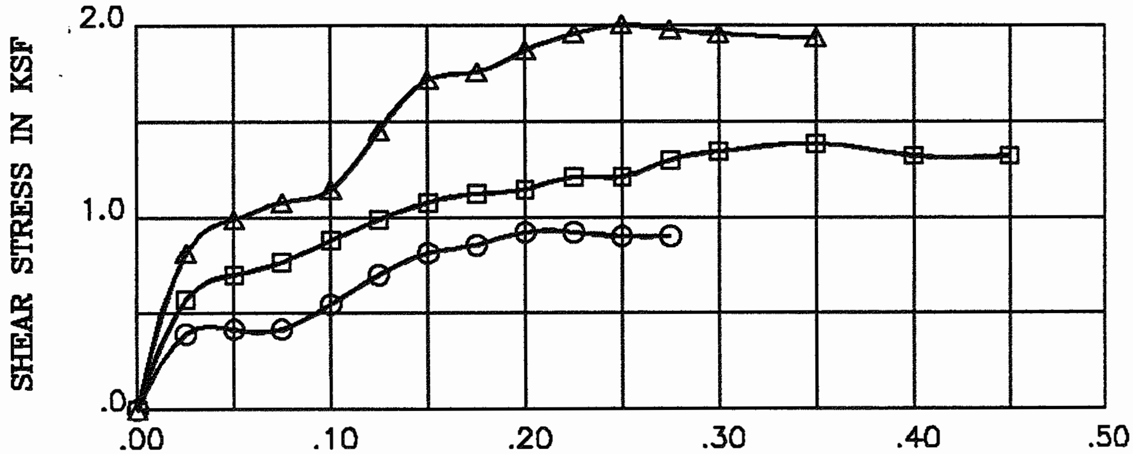


SYMBOL	BORING	DEPTH (ft)	LL (%)	PI (%)	DESCRIPTION
O	TP-1	4.0-5.3			SILT, Sandy (ML)

Remark : TEST METHOD: ASTM D422

D34301.02	PROPOSED WATERTANK
The Twining Labs Inc. Fresno, CA	GRAIN SIZE DISTRIBUTION Figure No. 2





BORING/SAMPLE : B-1 DEPTH (ft) : 5-5.5

DESCRIPTION :

STRENGTH INTERCEPT (C) : .369 KSF

FRICTION ANGLE (PHI) : 28.1 DEG

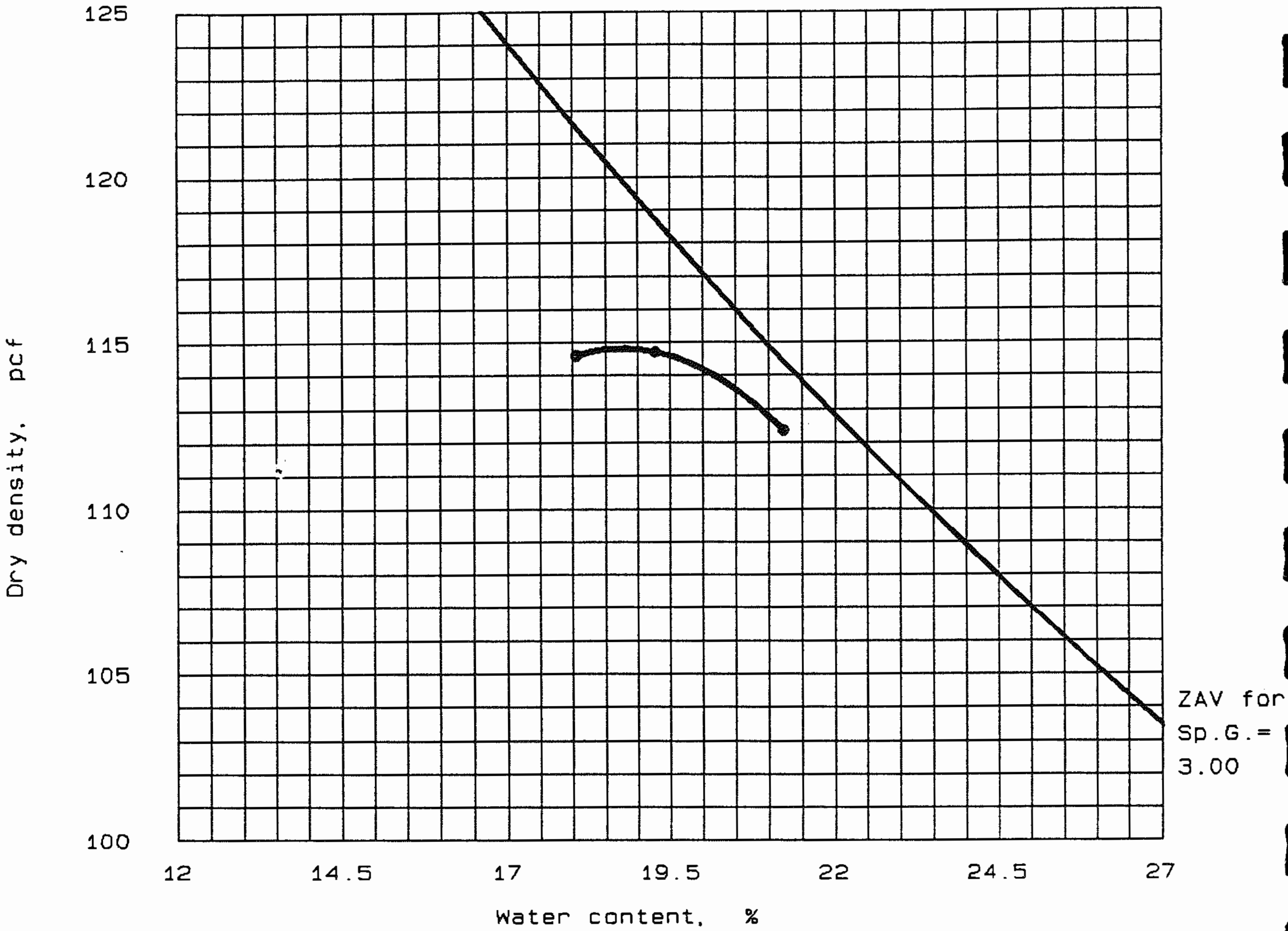
(PEAK STRENGTH)

SYMBOL	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	VOID RATIO	NORMAL STRESS (ksf)	PEAK SHEAR (ksf)	RESIDUAL SHEAR (ksf)
○	28.7	103.6	.626	1.00	.93	.90
□	30.8	104.6	.611	2.00	1.38	1.31
△	31.2	102.3	.647	3.00	2.00	1.93

Remark : TEST METHOD: ASTM D3080

D34301.02	PROPOSED WATERTANK
The Twining Labs Inc. Fresno, CA	DIRECT SHEAR TEST Figure No. 3

PROCTOR TEST REPORT



"Modified" Proctor, ASTM D 1557, Method A

Elev/ Depth	Classification USCS	Classification AASHTO	Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
2-6.0				2.70				

TEST RESULTS	MATERIAL DESCRIPTION
Optimum moisture = 18.8 % Maximum dry density = 114.8 pcf	CLAY

Project No.: D34301.02

Project: PROPOSED WATERTANK

Location: TP-1

SAN MARTIN, CALIFORNIA

Date: AUGUST 6, :398

Remarks:

PROCTOR TEST REPORT

THE TWINING LABORATORIES, INC.

Figure No. 4

APPENDIX F

Biological Report

Prepared by

H.T. Harvey & Associates

May 1998

29 May 1998

Mr. Bert Verrips
Nolte and Associates, Inc.
1 N. First Street, Suite 450
San Jose, CA 95113
voice: 510.652.1666
facsimile: 510.547.6677

SUBJECT: Hayes Valley (Lions Gate): reconnaissance-level biotic constraints survey

Dear Mr. Verrips:

We have finished our reconnaissance-level field survey of the project modification areas. Two specific areas were surveyed, including: (1) the newly-proposed location of the water tank/access road, and; (2) winery site. The purpose of our survey was to determine if these proposed changes to the original project resulted in significant impacts to biotic resources on site. Survey personnel included Dr. Patrick Boursier, plant ecologist. A detailed project description and field review of each location was supplied by Mr. Ron Davis. Both of these two sites occur within the project boundaries intensively surveyed by H. T. Harvey & Associates staff in 1994-95 in preparation of our report entitled *Hayes Valley, Biological Resources Report* (30 Nov 95; PN 385-11). Each of the project modification sites are discussed below.

1. Water Tank/Access Road: The water tank/access road complex occurs within a habitat identified in our 1995 report as non-native annual grassland, and valley oak woodland. The access road will utilize a currently-existing, unimproved dirt road. The access road will cross a single seasonal drainage channel with an existing culverted crossing. The road and crossing will be upgraded to handle increased traffic and may result in relatively minor impacts to seasonal wetland habitats within the drainage (on the order of 10-25 square feet). It is our understanding that the steep portion of the existing road will remain as dirt or gravel during and after construction, some minor tree trimming of lower branches may be necessary to create a greater clearance for construction vehicles, no trees will be removed, and the only impact will include relatively minor loss of non-native annual grassland associated with the footprint of the proposed water tank. This proposed modification will not result in any additional direct or indirect impacts to biotic resources.
2. Winery Site: The winery site which includes a wine processing facility and minor planting of vineyards for aesthetic purposes occurs within the non-native annual grassland habitat. Our understanding is that no trees will be removed and

construction will not result in any additional impacts to wetland habitats. This proposed modification will not result in any additional direct or indirect impacts to biotic resources.

In summary, the proposed modifications discussed above will not result in significant impacts to existing biological resources, beyond those already identified and addressed in the approved Environmental Impact Report.

If you our your staff have any questions please feel free to contact me or Rick Hopkins.

Sincerely,

Patrick J. Boursier, Ph.D.
Division Head, Botany and Wetlands

APPENDIX G

Archaeological Report

Prepared by

Basin Research Associates

May 1998

BASIN
RESEARCH
ASSOCIATES

1933 DAVIS STREET
SUITE 210
SAN LEANDRO, CA 94577
VOICE (510) 430-8441
FAX (510) 430-8443

29 May, 1998

Mr. Bert Verrips
Nolte and Associates
1 North First Street
Suite 450
San Jose, CA 95113

RE: Review of Previous Cultural Resources Studies
Proposed Location of Water Tank and Winery
Lions Gate/Cordevalle Project, Santa Clara County

Dear Mr. Verrips,

Please let this letter serve as our review of the proposed location changes for the Water Tank and Winery for the above project.

As you are aware, the project is situated in an area which has undergone a number of archival reviews and archaeological inventories as a result of cultural resource compliance requirements. Four archaeological sites, CA-SCl-76, SCl-77, SCl-305/H and SCl-568 have been recorded within the boundaries of the proposed project although only one prehistoric site, CA-SCl-76, was relocated during the various field programs. This site was also the subject of a presence/absence testing program to determine its horizontal and vertical extent [Fig. 1]. The three other reported sites for the project area, CA-SCl-77, SCl-305/H and SCl-568, did not have any visible surface indicators of a prehistoric occupation at their recorded location nor did auger testing expose the presence of subsurface cultural materials at their reported locations.

A review of the archival material on file at our office for the project indicates that none of the planned changes for the location of the Water Tank and Winery will affect any known cultural resources. Both locations are within areas that were previously subject to an archaeological inventory with negative results.

It is Basin Research Associates' considered opinion that the construction planned for the project can proceed as planned. No further archaeological research appears necessary and monitoring during subsurface construction at either the Water Tank or Winery does not appear warranted. It is recommended that if any unanticipated prehistoric or significant historic era cultural materials are exposed during construction, operations should stop within 20 feet of the find and a qualified professional archaeologist contacted for evaluation and further recommendations. Potential recommendations could include evaluation, collection, recordation, analysis, etc. of any significant cultural materials followed by a professional report.[1]

---

1. Significant prehistoric cultural resources are defined as human burials, features or other clusterings of finds made, modified or used by Native American peoples in the past. The prehistoric and protohistoric indicators of prior cultural occupation by Native Americans include artifacts and human bone, as well as soil discoloration, shell, animal bone, sandstone cobbles, ashy areas, and baked or vitrified clays. Prehistoric materials may

If I can provide any additional information or be of further service please don't hesitate to contact me.

Sincerely yours,
BASIN RESEARCH ASSOCIATES, INC.

Colin I. Busby
Principal

CIB/dg

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include:

a. Human bone - either isolated or intact burials.
b. Habitation (occupation or ceremonial structures as interpreted from rock rings/features, distinct ground depressions, differences in compaction (e.g., house floors).
c. Artifacts including chipped stone objects such as projectile points and bifaces; groundstone artifacts such as manos, metates, mortars, pestles, grinding stones, pitted hammerstones; and, shell and bone artifacts including ornaments and beads.
d. Various features and samples including hearths (fire-cracked rock; baked and vitrified clay), artifact caches, faunal and shellfish remains (which permit dietary reconstruction), distinctive changes in soil stratigraphy indicative of prehistoric activities.
e. Isolated artifacts

Historic cultural materials may include finds from the late 19th through early 20th centuries. Objects and features associated with the Historic Period can include.

a. Structural remains or portions of foundations (bricks, cobbles/boulders, stacked field stone, postholes, etc.).
b. Trash pits, privies, wells and associated artifacts.
c. Isolated artifacts or isolated clusters of manufactured artifacts (e.g., glass bottles, metal cans, manufactured wood items, etc.).
d. Human remains.

In addition, cultural materials including both artifacts and structures that can be attributed to Hispanic, Asian and other ethnic or racial groups are potentially significant. Such features or clusters of artifacts and samples include remains of structures, trash pits, and privies.

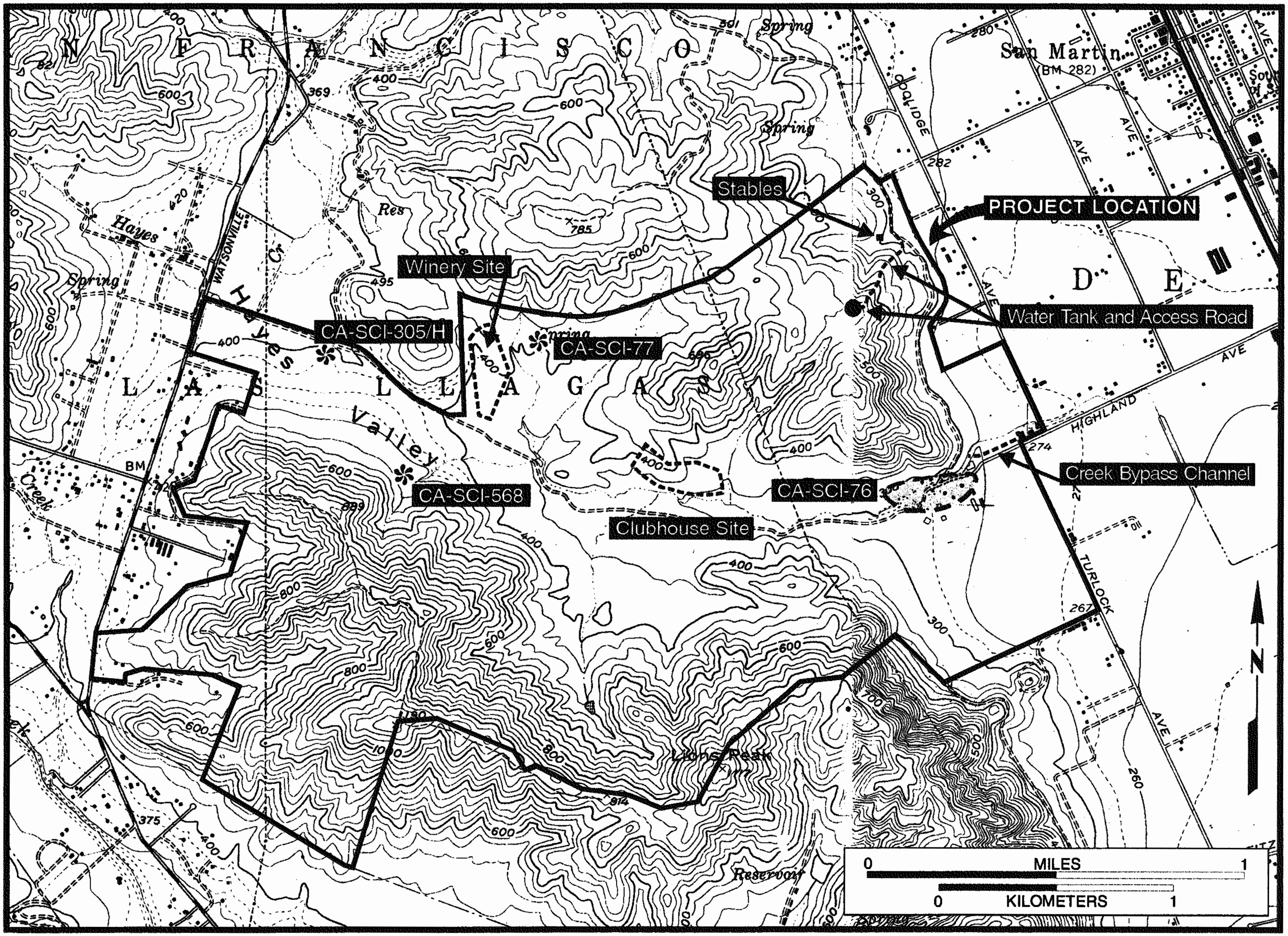


Figure 1: Project Location with Archaeological Sites and Planned Changes (USGS Mt. Madonna, Calif. 1980 and Gilroy, Calif. 1981)

CORDEVALLE ENVIRONMENTAL AUDIT

MITIGATION AND MONITORING PROGRAM COUNTY OF SANTA CLARA, JULY 1996

Submitted to:

Joe Root, General Manager
CordeValle, One CordeValle Club Drive
San Martin, CA 95046

Prepared by:

LSA Associates, Inc.
157 Park Place
Pt. Richmond, California 94801
(510) 236-6810

LSA Project No.

LSA

September 18, 2003

TABLE OF CONTENTS

LIST OF FIGURES

INTRODUCTION

This document is an environmental audit for the CordeValle project of the Mitigation and Monitoring *Program* (MMP) prepared by the County of Santa Clara (County), dated July 1996. The following environmental categories are addressed in this report:

- Agriculture
- Parks, Recreation and Open Space
- Geology and Soils (item 11 only)
- Hydrology and Drainage
- Water Quality
- Biological Resources
- Archaeology
- Visual and Aesthetics
- Hazardous Materials, Public Health and Safety
- Water Supply
- Wastewater Treatment and Disposal
- Solid Waste

This report follows the order and uses the same numbering as the County's original document. Environmental categories not relevant to our inquiries (e.g., fire protection, police and security, etc.), have been omitted.

For each environmental category addressed, the following headings incorporate text from the County's 1996 document: *Assumed Impacts, Original Mitigation*, and *Monitored By*. *Actual Impacts* are generated from LSA's current environmental audit of the CordeValle project. Finally, *Adjusted Mitigation/Recommendations* will be developed at the direction of the County in consultation with the resource agencies and LSA. Twining Laboratories, Inc. (Twining) addressed the water quality issues in this report.

IMPACTS AND MITIGATIONS

B. AGRICULTURE

1. Loss of Farmland

Assumed Impact. The development of the site would result in the loss of approximately 180 acres of Class II soils, including approximately 110 acres designated as "Prime Farmland" or "Farmland of Statewide Importance." (Potential Significant Impact)

Original Mitigation. The loss of approximately 110 acres of prime farmland would be offset by the planting of vineyards and/or orchards in areas not proposed for development. (Less-than-Significant Impact with Mitigation)

Monitored By. Planning Office.

Actual Impact. LSA used a based map of parcel boundaries in CAD, prepared by MH Engineering of Morgan Hill for CordeValle (Figure 1). A land use map was generated and acreages of each land use type were calculated using the CAD program. A newly installed vineyard occupies 92 acres and an adjacent winery occupies 18 acres, for a total of 100 acres in wine production. Additional vineyards have been planted in the residential portion of the CordeValle site.

Adjusted Mitigation/Recommendations. An excess of 92 acres are in agricultural product. The County should determine if this measure has been met.

2. Conflict with Off-site Agriculture

Assumed Impact. The residential lots proposed at the eastern end of the site would potentially create land use conflicts with nearby agricultural operations. (Potential Significant Impact)

Original Mitigation. The creation of buffer zones along the eastern edge of the site would minimize the interface conflicts with existing farming operations. (Less-than-Significant Impact with Mitigation)

Monitored By. None required.

Actual Impact. The closest lot line is 150 feet from the edge of Turlock Avenue, and the nearest agriculture is on the opposite side of the approximately 50-foot-wide public street. The closest house in the CordeValle cluster development is 220 feet from the road. Between the lot line and the highway are vineyards, an ornamental water

LSA

FIGURE 1

(Preliminary boundary lines to be adjusted
to aerial photograph base)

CordeValle
Land Use

SOURCE: MH ENGINEERING CO. (11/14/02)

P:\HVD330\g\LandUsefigure1.dwg (9-18-03) feature, and a landscaped berm. Residential housing is sufficiently buffered by distance, landscaping, and ground contouring.

Adjusted Mitigation/Recommendations. No additional mitigation recommended.

C. PARKS, RECREATION AND OPEN SPACE

1. Loss of Open Space

Assumed Impact. The conversion of portions of the site to golf course and residential uses would represent a substantial loss of semi-natural open space. (Potential Significant Impact)

a. Original Mitigation. The project would provide approximately 263 acres of managed recreational open space in the form of a golf course. The golf course would provide an added recreational opportunity in the County.

Monitored By. None required.

Actual Impact. The footprint of the golf course and associated buildings is approximately 264 acres (Figure 1).

Adjusted Mitigation/Recommendations. No additional mitigation is recommended.

b. Original Mitigation. The remaining 1,265 acres of natural and semi-natural area of the site would be preserved as permanent open space as a condition of the cluster development permit.

Monitored By. Planning Office.

Actual Impact. The open space area is approximately 1,088 acres (Figure 1). This open space area is comprised of a 741-acre parcel on the south side of the CordeValle site, a 325-acre parcel on the north side, and a 22-acre strip north of the vineyard in Hayes Valley. Additional undeveloped land forms a buffer around the golf course.

Adjusted Mitigation/Recommendations. Designated open space land is in excess of 1,088 acres with additional undeveloped acreage around the golf course. The County should determine if the acreage requirement has been met.

The open space areas as illustrated in the attached land use map should be formally designated and legal easements be recorded. The Santa Clara County Zoning Ordinance (July 3, 2003) section 5.45.050.D.1. Open Space Preservation, Permanent Dedication of Open Space, provides the following provisions for open space preservation as part of a cluster subdivision:

In order to ensure that open space preserved through the cluster development will be permanent, dedication of development rights to the County of Santa Clara shall be required through recorded open space easements. Dedication of such development rights may also be made to more than one public agency, such as the Santa Clara County Open Space Authority or Midpeninsula Regional Open Space District, in conjunction with the county, if such agency is a willing participant. Open space easements shall regulate the future use of the open space, and, where necessary and appropriate to preserve the natural resources of the area or to effectuate required environmental mitigations or conditions of approval, shall specify the land owner's and management and maintenance obligations.

Because the open space area at CordeValle is dedicated as mitigation to loss of wildlife habitat, more restrictive allowable uses should apply. No destruction or degradation of habitat will be allowed in the open space habitat lands, with the following exceptions noted below. No other development will be allowed within the open space habitat areas. The following allowable uses are recommended:

- *Habitat Management Facilities*. Facilities for the management of habitat such as maintenance access roads and exclusionary fences will be allowed. Mitigation ponds and waterways may be built in the open space habitat area as well. In addition to the initial grading and earth moving, on-going activities may be necessary to maintain the ponds and waterways. Maintenance activities may include inspecting and repairing dams. Motor vehicles will be allowed for maintenance purposes only, and not for recreational purposes.

- *Recreational Facilities*. Recreational uses compatible with the overall wildlife habitat management objectives will be permitted, such as installation and maintenance of trails. Use of these trails will be restricted to people on foot, bicycle, or horse. No dogs will be allowed in the open space areas, due to potential conflicts with wildlife.

- *Water Development Facilities*. Water tanks, surrounding pads, and access roads may be installed and maintained in the open space habitat area at the discretion of CordeValle. These water tanks may be used to serve the adjacent developed areas.

- *Utilities*. Gas pipelines, electrical transmission lines, communications towers, and the like may be installed in the open space areas at the discretion of CordeValle. Service roads and similar maintenance facilities will also be allowed for these utility functions.

- *Disposal of Organic Waste.* Disposal of organic waste such as tree limbs and herbaceous matter is allowable in the open space areas.

The following restrictions are recommended for the open space lands:

- Use or possession of firearms or fireworks of any kind. The exception to this restriction would be feral animal control, such as removal of feral pigs.

- Driving, chipping, or in any other manner playing or practicing golf or hitting golf balls. No active sport activity such as baseball, football, etc. is allowed.

- Recreational operation of self-propelled model airplanes, boats, automobiles, or other model craft of any kind or description. All-terrain vehicles, trucks, etc. may be used for maintenance and patrolling the open space areas.

- Operating missiles, rockets, or similar projectiles.

- Hunting, molesting, disturbing, injuring, trapping, netting, poisoning, or killing any kind of wild native animal. This restriction does not apply to domestic and non-native animals such as feral pigs. This restriction does not apply to management activities for enhancing wildlife such as relocating California tiger salamander larvae to new ponds.

- Dogs are not permitted.

- Wood cutting and commercial timber harvest are not permitted.

- Abandoning, dropping off, or feeding domestic or feral animals, including cats. Any abandoned animal may be removed. Other than horses being ridden, no other pets are allowed. This prohibition does not apply to livestock and other ranch animals, under control of the rancher.

- Operating a car, motorbike, motorcycle, or any other motor vehicle except in conjunction with authorized ranching operations, habitat maintenance and enhancement activities, and fire prevention and control.

- Using rodenticides and other chemical poisons is not permitted.

- Agricultural activities, other than ranching, are not permitted.

CordeValle should develop and distribute an educational flyer explaining the restrictions to members, guests, and residents. Signs should be posted at the entrances to the open space trails, alerting visitors of the restrictions. CordeValle will be responsible for installing the signs.

c. **Original Mitigation.** A trail easement for the 2 to 3-mile segment of the proposed San Martin Cross-Valley Trail would be dedicated in conjunction with the project. Segments of two additional trails along the project frontages on Coolidge Avenue and Watsonville Road would be dedicated and improved in conjunction with required roadway dedications and improvements. (Less-than-Significant Impact with Mitigation)

Monitored By. Planning Office.

Actual Impact. None of the named trails have been dedicated. CordeValle has constructed additional hiking trails and signage in the southern portion of the open space area.

Adjusted Mitigation/Recommendations. A recommended route for the San Martin Cross-Valley Trail, which minimizes impacts to sensitive natural resources, should be developed and the easement recorded.

D. GEOLOGY AND SOILS

11. Grading in Serpentine Hillsides

Assumed Impact. Any unplanned grading or construction activity that encroaches upon the on-site serpentine hillsides could result in the release of airborne particulates of naturally-occurring chrysotile asbestos previously bound in the rock, potentially causing a public health hazard in the form of inhalation. (Potential Significant Impact)

Original Mitigation. The disturbance of the serpentine bedrock area would be avoided by ensuring that no development or grading is planned for this area. In addition, the edge of this area would be flagged, fenced or roped-off to prevent inadvertent encroachment by construction equipment. (Less-than-Significant Impact with Mitigation)

Monitored By. LDE&S.

Actual Impact. The serpentine habitat area as illustrated in the Draft EIR was not fenced as specified. No signs restricting passage were observed. Because the serpentine area is in an isolated portion of the project site, it is unlikely to receive significant use by people.

Adjusted Mitigation/Recommendations. The EIR reports the presence of two special-status plant species and a special-status invertebrate in the serpentine area, making this an especially valuable and sensitive area. Even though currently there do not appear to be any threats from unauthorized entry into the area, we recommend that barbed wire fencing be erected around the designated serpentine area. The fencing should be suitable for either excluding cattle or for enclosing cattle. The fencing should have an entry gate as well. This would allow for the use of cattle grazing in the future, if that were deemed an effective vegetation control method to encourage native serpentine plants and discourage exotics. In addition, permanent signs should be posted every 200 feet along the fence line stating, "No Entry – Sensitive Habitat Area."

E. HYDROLOGY AND DRAINAGE

1. Downstream Flooding

Assumed Impact. The project would potentially result in increased downstream flooding during the 100-year and 10-year storms. (Potential Significant Impact)

Original Mitigation. The on-site lake proposed for the southern residential cluster subdivision would be designed to provide sufficient detention storage for increased peak runoff resulting from site development. With this pond, the peak flow rates leaving the project site during the 100-year and the 10-year storms would be lower than under existing conditions. (Less-than-Significant Impact with Mitigation)

Monitored By. LDE&S.

Actual Impact: Design storm flow events were not observed by Twining. Future studies are needed to verify the original capacity design with Pacific Advanced Civil Engineering (PACE) and as-built condition with respect to the design.

Adjusted Mitigation/Recommendations. To be determined.

2. Shallow Flooding

Assumed Impact. Portions of the residential cluster subdivisions would be subject to shallow flooding (one-foot average depth) during a 100-year event, and the proposed structures could also partially obstruct this sheet flow through the site. (Potential Significant Impact)

Original Mitigation. Potential impacts to the residential subdivisions from shallow flooding would be mitigated by constructing building pads on fills raised above flood elevations. The partial obstruction of shallow overland sheet flows by the proposed development would be mitigated by balancing fills with cuts within the flood-prone areas. (Less-than-Significant Impact with Mitigation)

Monitored By. LDE&S.

Actual Impact. Twining found no evidence of significant shallow flooding. Residential surface water drainage controls include surface swales, gutters, and ditches. Surface water collection to the storm drain system conveys surface water to the lakes complex.

Adjusted Mitigation/Recommendations. No further action recommended.

F. WATER QUALITY

1. Erosion Runoff

Assumed Impact. During grading and construction, erosion from exposed slopes, and pollutants from equipment may result in water quality impacts to downstream water bodies. (Potential Significant Impact)

Original Mitigation. The final golf course grading plan would be required to conform to all drainage and erosion control standards adopted by Santa Clara County and would require approval by the County. A comprehensive erosion control program and Storm Water Pollution Prevention Plan (SWPPP) would be required to be implemented during grading and construction (see text for details). (Less-than-Significant Impact with Mitigation)

Monitored By. LDE&S.

Actual Impact. Temporary erosion controls such as silt fencing and straw bails were utilized during construction according to Twining. Construction of the project has been completed. Periodic observations conducted by Twining during the construction phase did not reveal any significant erosion event impacting the West Branch of the Llagas Creek or to tributaries within the project area.

Adjusted Mitigation/Recommendations. Not applicable - construction completed.

2. Runoff from Paved Surfaces

Assumed Impact. After project completion, concentrated runoff from paved surfaces may result in isolated areas of erosion. (Potential Significant Impact)

Original Mitigation. Stormwater would be collected and dispersed in a manner to prevent concentrated flows, or outfall areas would be protected with channel armoring to prevent erosion and scouring. (Less-than-Significant Impact with Mitigation)

Monitored By. LDE&S.

Actual Impact. Rip-rap was noted at stormwater pipe discharge points. No significant erosional features were observed by Twining. However, some areas were obscured by vegetation.

Adjusted Mitigation/Recommendations. A plan should be developed including time frames for observation and documentation of potential erosion events, and guidelines for timely repair of erosional features to reduce the rate of future soil loss and sedimentation of the stream bed at stormwater pipe discharge points.

3. Nonpoint Urban Pollutants

Assumed Impact. The project would generate nonpoint urban pollutants which may be carried in stormwater runoff from paved surfaces to downstream waterbodies. (Potential Significant Impact)

Original Mitigation. The project would include stormwater controls at the parking lots and maintenance facility. (Less-than-Significant Impact with Mitigation)

Monitored By. LDE&S.

Actual Impact. Stormwater controls for nonpoint urban pollutants were not noted by Twining at the parking lots and maintenance facility upon the preliminary site review in August 2003, except that some of the drop inlet structures appear to allow some settling and removal of sediments prior to discharge to the surface water courses. A golf cart washing area was established on the parking lot opposite the club house. This facility was adjacent to a stream and lacked any runoff controls.

Adjusted Mitigation/Recommendations. It is recommended that further review be conducted of the surface water run-off facilities at the above mentioned paved surfaces. Original approved project plans have been solicited from Guilliani & Kull, grading and drainage engineers for the CordeValle project. Based on additional site review and review of plans, an assessment should be made of the extent to which BMPs for stormwater management have been implemented. Possible means of improving sediment removal include implementation of BMPs including retrofitting facilities with filters, or re-routing surface flow across vegetated swales prior to discharge to natural surface water courses.

4. Groundwater Impacts

Assumed Impact. The project may result in water quality impacts to groundwater due to the use of fertilizers and pesticides on the golf course. (Potential Significant Impact)

Original Mitigation. The project would follow irrigation and chemical management practices under which application of water, fertilizers and chemicals would precisely meet plant needs, thus minimizing potential for leaching into the groundwater table. Monitoring wells would be installed to sample for the presence of golf course chemicals, with corrective action taken if necessary. (Less-than-Significant Impact with Mitigation)

Monitored By. The *Environmental Management Plan* for this Lion's Gate project (contained in Appendix E of the EIR), sets forth detailed specifications for turf management including irrigation and pest control, and contains detailed monitoring programs for groundwater and surface water. A report by the golf course superintendent verifying compliance with the chemical application management plan and the integrated pest management plan shall be submitted to Planning Office and Agriculture Commissioner's office annually. Water sampling and testing is to be conducted by a qualified environmental specialist or firm, with the frequency of monitoring to take place as specified in the *Environmental Management Plan*. Monitoring reports are to be submitted to the Planning Office annually, or in the event that any monitoring result exceeds the applicable health standard, the Planning Office is to be notified immediately and consulted as to appropriate remedial action.

Actual Impact. Preliminary interviews with the golf course superintendent suggest that many of the provisions of the *Environmental Management Plan* have been implemented. A full assessment of the extent of compliance with the *Environmental Management Plan* document is currently being conducted.

A *Groundwater and Surface Water Monitoring Plan* (May 8, 1997) was prepared by the Twining. The plan set forth a monitoring program capable of detecting potential degradation to groundwater and surface water resulting from operations of the golf course and wastewater treatment facility. The plan was approved along with the Wastewater Discharge Requirements for the facilities. Groundwater and surface water were sampled and tested by Twining approximately quarterly (every 3 months) between April 1997 and February 1999. Records suggest that the surface and groundwater monitoring was not conducted between May 1999 and August 2003. Monitoring was conducted by Twining on September 3, 2003, in conjunction with the current environmental audit. The analytical results of the testing are in progress.

A review of the monitoring facilities by Twining in August 2003 indicated three of the six monitoring wells were destroyed as a result of construction activities. In addition, records do not indicate that the wells were ever surveyed.

Adjusted Mitigation/Recommendations.

1) It is recommended that a questionnaire be submitted to the golf course superintendent to assess compliance with the chemical application management plan and the integrated pest management plan. Based on the results of the questionnaire, additional recommendations would be prepared for implementing the *Environmental Management Plan*.

2) It is recommended that a summary report be prepared of the results of all groundwater monitoring conducted to date. The report should summarize the analytical test results for groundwater samples and highlight results which exceed applicable health standards (if any).

3) All monitoring wells should be survey for location and elevation and all existing groundwater depth data should be correlated with the surveyed elevations and tabulated.

4) It is also recommended that the three destroyed monitoring wells be replaced with new wells. New well locations should be approved by the LEA and Regional Quality Control Board prior to new construction.

5) A groundwater and surface water monitoring event should be conducted in December 2003 and every three months thereafter in accordance with *Groundwater and Surface Water Monitoring Plan*.

5. Surface Water Impacts of Fertilizers and Pesticides

Assumed Impact. The project may result in water quality impacts to surface water from fertilizers and pesticides used on the golf course. (Potential Significant Impact)

Original Mitigation. The potential for surface water quality impacts from golf course chemicals would be mitigated by infiltration into turf and rough areas, the use of grass filter strips, maintenance of setbacks for streams, and strategic installation of subdrains and retention basins. Surface water quality would be sampled and tested periodically, with corrective action taken if necessary. (Less-than-Significant Impact with Mitigation)

Monitored By. Water sampling and testing is to be conducted by a qualified environmental specialist or firm, with the frequency of monitoring to take place as specified in the *Environmental Management Plan*. Monitoring reports are to be submitted to the Planning Office annually, or in the event that any monitoring result exceeds the applicable health standard, the Planning Office is to be notified immediately and consulted as to appropriate remedial action.

Actual Impact. Mitigation of surface water quality impacts are currently being assessed by Twining. Initial site reconnaissance indicated that surface water survey monuments could not be located in the areas designated as surface water sampling points in the *Groundwater and Surface Water Monitoring Plan*. A full assessment of the extent of compliance with the *Environmental Management Plan* document is currently being conducted.

Adjusted Mitigation/Recommendations. The assessment of the extent of compliance with the *Environmental Management Plan* document should consider the results of the recommended questionnaire (see recommendation 1 above). Permanent surface water monitoring facilities were not noted at the location specified in the *Groundwater and Surface Water Monitoring Plan*. Survey monument points should be established at the monitoring locations prior to the 2003 wet season. This will permit accurate surface water flow measurements in accordance with the *Groundwater and Surface Water Monitoring Plan*. A surface water sampling program should be reestablished in 2003 after an appropriate rainfall event as defined in the

Groundwater and Surface Water Monitoring Plan and the program should be maintained in accordance with the *Groundwater and Surface Water Monitoring Plan*.

6. Impacts from Equestrian Center

Assumed Impact. The equestrian center could result in impacts to groundwater and surface water quality if manure or stall sweepings accumulate in stormwater runoff. (Potential Significant Impact)

Original Mitigation. The equestrian center would be operated in accordance with a manure management plan and an erosion control plan; and runoff from the facility would be directed to an on-site retention pond. (Less-than-Significant Impact with Mitigation)

Monitored By. LDE&S.

Actual Impact. No equestrian center has been built and permits for building a new equestrian center have expired.

Adjusted Mitigation/Recommendations. No further action is required for this mitigation measure. If CordeValle again wishes to build the equestrian center, new permits would need to be obtained from the resource agencies.

7. Soils in Livestock Corrals

Assumed Impact. The soils in the existing livestock corrals may contain accumulated nitrogenous compounds which could result in impact to surface and groundwater quality. (Potential Significant Impact)

Original Mitigation. The potentially affected soils would be sampled for nitrogen content and incorporated into the grading of the golf course in a manner that makes maximum benefit of the fertilizer value of the soil. (Less-than-Significant Impact with Mitigation)

Monitored By. A report by a certified professional soils scientist or a certified agronomist shall be submitted to Planning Office prior to issuance of the grading permit.

Actual Impact. The County issued the grading permit, which implies that the soils report had been submitted. The livestock corrals are no longer present on the CordeValle site.

Adjusted Mitigation/Recommendations. No further action is required.

G. BIOLOGICAL RESOURCES

1. Removal of Non-native Grasslands, etc.

Assumed Impact. The project would involve the removal of 246 acres of non-native grasslands, orchards, cropland and residential landscaping. (Less-than-Significant Impact)

Original Mitigation. No mitigation required. (Approximately 482 acres of grasslands would be included in the area to remain as permanent open space.)

Monitored By. None required.

Actual Impact. Approximately 591 acres are in development land use categories (e.g., vineyard, winery, golf course, and residential) on the approximately 1,679-acre CordeValle site (Figure 1). However, not all of these 591 acres have been developed. Approximately 1,088 acres have been preserved in designated open space areas, much of which includes grasslands.

Adjusted Mitigation/Recommendations. An excess of 482 acres of grassland has been preserved in the 1,088-acre open space areas. No additional mitigation for the removal of non-native grassland, orchards, cropland, and residential landscaping is recommended.

2. Oak Woodland on Lots 24 and 25

Assumed Impact. Development of the two partially wooded lots (Lots 24 & 25) in the residential cluster subdivision in the southeastern portion of the site may result in the limited removal of valley oak woodland. (Potential Significant Impact)

Original Mitigation. The removal of valley oak woodland within Lots 24 & 25 would be avoided to the extent feasible by placing the building envelopes in areas with relatively little tree cover. Any valley oaks which cannot be avoided by the future residential construction would be replaced at a ratio of 5:1. (Less-than-Significant Impact with Mitigation)

Monitored By. Secretary of Architecture and Site Approval Committee.

Actual Impact. Lot 24 has not been developed, and lot 25 has only been partially developed. Comparing high resolution aerial photographs from June 15, 1993 and August 21, 1998 to a current aerial photograph from August 12, 2003, no trees appear to have been removed.

Adjusted Mitigation/Recommendations. No further action is required for this mitigation measure. If CordeValle again wishes to further develop lots 24 and 25, new permits would need to be obtained from the resource agencies.

3. Loss of Riparian Vegetation

Assumed Impact. The project would result in the loss of 0.83 acres of riparian vegetation or in the reduction of habitat quality in the riparian zone. (Potential Significant Impact)

Original Mitigation. Impacts to the riparian habitat would be avoided to the extent feasible. The unavoidable loss of riparian vegetation and the reduction of habitat value would be mitigated by the on-site replacement of lost habitat, and by measures to protect and enhance the remaining habitat. (Less-than-Significant Impact with Mitigation)

Monitored By. The *Conceptual Creek Revegetation/Enhancement Plan* for the Lion's Gate project (contained in Appendix F of the EIR), sets forth detailed specifications for replanting within the riparian corridor. The monitoring and maintenance of the revegetation/enhancement area is to take place for a period of 5 years (or longer if necessary) in accordance with the monitoring schedule set forth in the plan. The plan is to be deemed successful, if after 5 years, 2.5 acres of riparian habitat has been established with a vegetative cover of a least 50 percent, and with 85 percent of all planted trees and shrubs being alive and likely to survive without further maintenance. Monitoring and maintenance is to be conducted by a qualified biologist, who will submit annual reports to the Planning Office for at least 5 years until the plan has been deemed to be successfully implemented.

Actual Impact. LSA compared high resolution aerial photographs from June 15, 1993 and August 21, 1998 to a current aerial photograph from August 12, 2003. No impacts to riparian vegetation other than the placement of bridges and the removal of a few trees was discernable. We feel this is consistent with the assumed impact to 0.83 acres of riparian vegetation.

Adjusted Mitigation/Recommendations. The *Conceptual Creek Revegetation/Enhancement Plan* for the Lion's Gate project (contained in Appendix F of the EIR) specified that 2.5 acres of riparian vegetation plantings be established along Llagas Creek. While little specific planting of riparian species appears to have occurred along the creek, numerous volunteer riparian tree and shrub species, such as valley oak, western sycamore, and elderberry have become established since the golf course was built. These volunteers will establish riparian vegetation along Llagas Creek as specified in the plan (Figure 2) illustrates the locations of volunteer and planted trees.

A planted series of western sycamore, coast live oak, and willow trees, 1.7-acres in size, is located in along a drainage adjacent to the vineyard near the maintenance buildings. Two additional drainage areas, 0.2-acres and 0.3-acres, adjacent to the clubhouse and parking lot, are also planted with western sycamore, valley oaks, coast live oaks, and California buckeye trees. These three areas were planted with native tree species consistent with riparian requirements specified in the *Conceptual Creek Revegetation/Enhancement Plan*.

LSA

FIGURE 2

CordeValle
Trees

SPECIES
- Blue Oak
- Buckeye
- Elderberry
- Live Oak
- Valley Oak
- Western Sycamore
- Willow

ORIGIN
- ▲ Planted
- ★ Transplanted
- ● Volunteer
- Planted Riparian Areas
- Additional Willow Aggregation

700 350 0 700 FEET

I:\hvd330\gis\maps\Aerial Histogram 11x17-inch_Fig2.mxd

In addition, portions of several drainages: between holes 10 and 18, between holes 15 and 17, near the maintenance buildings, and in Llagas Creek at the base of Pond 7 support dense patches of willow trees that were not present prior to golf course development. These patches of willow trees, 0.7-acres altogether, are consistent with riparian requirements specified in the with riparian requirements specified in the *Conceptual Creek Revegetation/Enhancement Plan*.

Taken altogether, the provides 2.9-acres of riparian vegetation in place after construction of the CordeValle project.

The riparian habitats do not appear to currently meet the standards specified in the *Conceptual Creek Revegetation/Enhancement Plan* with regards to establishment or percent cover. Trees in the planted areas do not appear well enough established to survive without supplemental watering and the canopies of all but the willow areas do not yet approach 85% cover. LSA recommends that monitoring of these areas, consistent with the *Conceptual Creek Revegetation/Enhancement Plan*, be initiated and continue until the standards are met.

The riparian species establishing within the CordeValle site are represented by six species of trees and no understory species. LSA recommends that additional understory species be planted in the designated riparian habitat areas for shrubs along the West Branch of Llagas Creek, according to the *Conceptual Creek Revegetation/Enhancement Plan*. Recommended riparian understory species include (*Rubus ursinus*), currant (*Ribes* sp.), snowberry (*Symphoricarpos* sp.), California rose (*Rosa* californica), California grape (*Vitus californica*), blue elderberry (*Sambucus mexicana*), and honeysuckle (*Lonicera hispidula*).

4. Tree Removal on Golf Course

Assumed Impact. The proposed golf course would result in the removal of up to 18 trees. (Potential Significant Impact)

a. Original Mitigation. Existing trees would be preserved to the greatest extent possible.

Monitored By. Trees to be saved shall be clearly marked on site and inspected by [the] Secretary of ASA. Report on success of tree replacement program prepared by a qualified arborist/landscape architect shall be submitted to the Secretary of ASA monthly during the construction phase of the golf course, and then on an annual basis for a period of 5 years following beginning of golf course operation.

Actual Impact.

Tree Removal Documentation. No documents specifying a tree replacement program were located. In a letter to Gary Rudholm of the County Planning Department from Ron Davis of CordeValle reporting tree removal up to January of 1998, Mr. Davis reports that 13 trees (7 valley oaks, 5 willows, and 1 western sycamore) trees were removed and that 65 replacement trees (35 valley oaks, 25 willows, and 2 sycamores) were required.

Mr. Davis' letter, it should be noted, refers to the total development and not just to the golf course. The language of the EIR is unclear as to whether "golf course" refers to the entire golf course envelope including riparian corridor of the West Branch of Llagas Creek, or whether "golf course" refers more restrictively to only the turfed areas. Because the EIR also has separate mitigation measures relating to tree removal and replacement for the riparian corridor, the more restrictive interpretation may apply. However, for the purposes of this analysis, the more conservative and inclusive definition is applied. That is, the golf course and the riparian corridor are considered as a single entity.

Tree Removal Verification. Comparing high resolution current (August 12, 2003) to preconstruction (June 15, 1993 for the western two-thirds of the property and August 21, 1998 for the eastern third of the property) aerial photographs, LSA was able to identify eight trees missing from along the West Branch of Llagas Creek and another four trees missing from the golf course area, for a total of twelve trees or more. LSA could not identify the trees to species from the aerial photographs. In addition, two or more trees may have been clumped together on the aerial photograph and could have been counted as only one tree missing. Because of the possibility of undetected clumping, LSA's total of twelve trees should be understood as a minimum number of missing trees.

Additionally, two mature valley oak trees that were saved during construction have died. One tree along a drainage adjacent to the clubhouse died as a result of golf course maintenance activities (i.e. watering). This tree is further discussed below in section 4c. The second dead saved tree died from impacts related to the access road. This second tree is discussed below in section 5.

Furthermore, missing trees may not be the same as trees removed that were within the construction footprint. That is, some trees may have fallen and have been subsequently removed. For example, the trunk of one valley oak near the parking lot north of the clubhouse broke and fell during a storm in May 2003. The tree was subsequently cut off at the base, below the break, and removed. This tree was not counted in the total of twelve missing trees.

Conclusion Regarding Removed Trees. LSA's total of twelve missing trees is close enough to the total of thirteen removed trees to assume that approximately thirteen trees had been removed by the construction of the project. Two additional trees have been lost to on-going operations activities. Altogether, 15 trees have been lost due to construction.

Transplanted Trees. In addition to trees that may have been removed from the developed portions of the site, at least 53 coast live oak trees were transplanted from the open space areas on the CordeValle property to locations in and around the golf course (Joe Root, pers. com.) (Figure 2). While most of these transplanted trees have survived to date, several are in decline or are in a stressed condition, and will require further evaluation, monitoring, and recommendations. Current cultural conditions and golf course maintenance will need to be modified in order to successfully establish these trees.

Adjusted Mitigation/Recommendations. According to the original mitigation measure, CordeValle is responsible for replacement of approximately 13 trees due to direct removal by construction activities. Two additional trees have been lost to indirect impact related to development after construction. At this time CordeValle is responsible for a total replacement obligation of 15 trees.

Several preserved and transplanted trees are stressed and additional trees may eventually die. Should additional trees die as a result of golf course operations, each would be replaced at the specified ratio.

Based on counts made of native tree plantings and volunteers, the CordeValle site includes 281 valley oaks (9 planted and 272 volunteer), 51 western sycamores (38 planted and 13 volunteer), 41 live (and 16 dead) willows (4 planted and 37 volunteer), 7 blue oaks (6 planted and 1 volunteer), 6 elderberry shrubs (all volunteers), and 217 coast live oaks (209 planted and 8 volunteer) that have appeared on the site since construction (Figure 2 and following table). In addition, there are another three stands of volunteer willows for which actual numbers of constituent trees have not been counted, but which contribute another 40 to 150 trees (Figure 2). This would put the CordeValle project in excess of the number of replacement trees required and no further mitigation should be required. However, the loss of additional trees may require additional mitigation plantings. Monitoring should be conducted according to the original plan for the prescribed five years.

Table. Trees that have appeared at CordeValle since 1997.

Species	Transplanted	Planted	Volunteers
Coast live oak	53	209	8
Valley oak	0	9	272
Blue oak	0	6	1
Western sycamore	0	38	13
California buckeye	0	0	4

Species	Transplanted	Planted	Volunteers
Willow	0	4	37
Elderberry	0	0	6

b. Original Mitigation. A tree replacement program would be prepared to provide for replacement of native trees removed by the project.

Monitored By. Trees to be saved shall be clearly marked on site and inspected by [the] Secretary of ASA. Report on success of tree replacement program prepared by a qualified arborist/landscape architect shall be submitted to the Secretary of ASA monthly during the construction phase of the golf course, and then on an annual basis for a period of 5 years following beginning of golf course operation.

Actual Impact. See 4a, above.

Adjusted Mitigation/Recommendations. See 4a, above.

c. Original Mitigation. Detailed guidelines would be prepared by a certified arborist to minimize potential damage to trees to be preserved. (Less-than-Significant Impact with Mitigation)

Monitored By. Trees to be saved shall be clearly marked on site and inspected by [the] Secretary of ASA. Report on success of tree replacement program prepared by a qualified arborist/landscape architect shall be submitted to the Secretary of ASA monthly during the construction phase of the golf course, and then on an annual basis for a period of 5 years following beginning of golf course operation.

Actual Impact. Of the preserved trees onsite, two large valley oak trees have died since completion of the CordeValle project, and two are in decline. These trees were lost as a result of construction and maintenance activities (*i.e.* change of grade, root loss). The two declining trees were also affected by construction (one near the entry bridge and one near the clubhouse). The entry trees are discussed below under section 5.

Adjusted Mitigation/Recommendations. All trees lost due to golf course construction/maintenance activities should be replaced at a 5:1 ratio. The number of replacement trees on the CordeValle site currently exceeds the number of replacement trees needed for the project, and no new plantings are necessary at this time. As part of the tree monitoring program prescribed in 4a (above), the remaining "saved" trees will be monitored. If there are additional losses due to the management activities of CordeValle, replacement trees will be planted at a 5:1 ratio.

All native trees, both transplanted and preserved specimens, should be evaluated. Recommended actions should then be implemented and monitored. Recommended actions could include the addition/removal of irrigation, removal of turf within the dripline, addition of mulch, and removal of excess soil next to tree trunks. Evaluations and recommendations should be made by a certified or registered consulting arborist.

5. Access Road Impacts to Trees

Assumed Impact. The main access road would cross the driplines of several oak trees near the proposed eastern bridge across West Branch Llagas Creek, potentially resulting in stress or damage to those trees. (Potential Significant Impact)

Original Mitigation. Grading and paving within the driplines of the affected oaks would be subject to the recommendations of a qualified arborist to minimize stress and damage, with replacement required for any trees that do not survive. (Less-than-Significant Impact with Mitigation)

Monitored By. LDE&S.

Actual Impact. Comparing high resolution aerial photographs of the CordeValle site from June 15, 1993 and August 21, 1998 to a current aerial photograph from August 12, 2003, no trees appear to have been removed. However, no monitoring report has been filed to our knowledge. On September 10, 2003, a certified arborist from LSA determined that one of the subject valley oaks is dead and one is in severe decline.

Adjusted Mitigation/Recommendations. The trees lost should be replaced at a 5:1 ratio. The number of replacement trees on the CordeValle site currently exceeds the number of replacement trees needed for the project, and no new plantings are necessary at this time. As part of the tree monitoring program prescribed in 4a (above), the remaining "access road" trees will be monitored. If there are additional losses due to road construction, replacement trees should be planted at a 5:1 ratio.

6. Impacts to California Tiger Salamander

Assumed Impact. The proposed project may result in direct impacts to the California tiger salamander, a special-status species, and would result in loss of breeding habitat for the tiger salamander (Potential Significant Impact)

Original Mitigation. The project would include measures to reduce direct mortality to the California tiger salamander, and measures to preserve existing habitat and create new habitat to replace the habitat lost due to the project. (Less-than-Significant Impact with Mitigation)

Monitored By. The *California Tiger Salamander and Western Pond Turtle Mitigation Plan* for the Lion's Gate project (contained in Appendix F of the EIR) sets forth detailed specifications for the protection and enhancement of tiger salamander habitat on the site. Maintenance and monitoring is to be conducted by a qualified biologist in accordance with the schedule set forth in the plan. Annual reports are to be submitted to the Planning Office as well as the U.S. Fish and Wildlife Service and the California Department of Fish and Game.

Actual Impact. The prescribed mitigation measures have not been implemented. Determination of the present status and distribution of California tiger salamanders on the CordeValle site will require surveys in the winter of 2003-2004, which are now planned.

Adjusted Mitigation/Recommendations. Pending receipt of the findings of the planned winter 2003-2004 surveys for California tiger salamanders on the CordeValle site, a detailed management plan will be prepared and implemented for the California tiger salamander as prescribed in the EIR.

7. Impacts to Western Pond Turtle

Assumed Impact. The proposed project may result in direct impacts to the western pond turtle, a special-status species, and would result in the loss of potential upland habitat for the pond turtle. (Potential Significant Impact)

Original Mitigation. The project would include measures to preserve existing pond turtle habitat, and to create new habitat on the project site. (Less-than-Significant Impact with Mitigation)

Monitored By. The *California Tiger Salamander and Western Pond Turtle Mitigation Plan* for the Lion's Gate project (contained in Appendix F of the EIR), sets forth detailed specifications for the protection and enhancement of western pond turtle habitat on the site. Maintenance and monitoring is to be conducted by a qualified biologist in accordance with the schedule set forth in the plan. Annual reports are to be submitted to the Planning Office as well as the U.S. Fish and Wildlife Service, and the California Department of Fish and Game.

Actual Impact. LSA's July 2003 surveys found that the distribution of western pond turtles has expanded at CordeValle since construction of additional water features. Prior to construction, western pond turtles had been found only in Pond 7 year-round, and a few turtles were present in the West Branch of Llagas Creek during the wet season. Last July, turtles were found in Pond 7, a new pond adjacent to hole 8, and two new ponds adjacent to hole 18. This represents over a four-fold increase in the extent of occupied habitat by western pond turtles.
Although the distribution of western pond turtles has clearly been expanded due to the construction of the CordeValle project, the status of the species is less clear. It would appear that the population has expanded is concert with the expansion of occupied habitat. However, a bullfrog control program which had been in place

during the mid-1990's had been discontinued in 1998. By 2003, bullfrogs had reestablished themselves in Pond 7 and expanded into the new ponds. Bullfrogs are potential predators on hatchling western pond turtles.

The planned winter 2003-2004 western pond turtles surveys will address the population structure of the western pond turtle population on CordeValle. Mark-recapture studies will be conducted according to the protocols in the *California Tiger Salamander and Western Pond Turtle Mitigation Plan* (LSA 1995). Results will be compared to earlier mark-recapture studies for western pond turtles at CordeValle to determine changes in the demographics of the population. If the population has become skewed toward the adult cohort, this evidence would suggest that reproduction has been unsuccessful due to predation by bullfrogs.

Adjusted Mitigation/Recommendations. Pending receipt of the findings of the planned winter 2003-2004 surveys for western pond turtles on the CordeValle site, a detailed management plan will be prepared and implemented for the western pond turtle as prescribed in the EIR.

8. Serpentine Special-status Species

Assumed Impact. The special-status plant and invertebrate species of the serpentine grasslands on the site would be subject to potential disturbance by grading for the adjacent residential subdivision, and by the general intensification of human activity resulting from the project. (Potential Significant Impact)

Original Mitigation. The serpentine habitat area would be fenced, and signs would be posted to prevent encroachment of grading from the adjacent residential subdivision, and to prevent the incursion of human activities after the project is completed. (Less-than-Significant Impact with Mitigation)

Monitored By. LDE&S

Actual Impact. No impacts to the serpentine area were noted on LSA's site inspection in July 2003. However, July was not the appropriate time of the year to assess the status of special-status plants. Signage and fencing have not been installed around the serpentine area.

Adjusted Mitigation/Recommendations.

Serpentine Area Protection

The EIR reports the presence of two special-status plant species and a special-status invertebrate in the serpentine area, making this an especially valuable and sensitive area. Even though currently there do not appear to be any threats from unauthorized entry into the area, we recommend that barbed wire fencing be erected around the designated serpentine area. The fencing should be suitable for either excluding or enclosing cattle. The fencing should have an entry gate as well. This would allow for the use of cattle grazing in the future, if that were deemed an effective vegetation control method to encourage native serpentine plants and discourage exotics. In addition, permanent signs should be posted every 200 feet along the fence line stating, "No Entry – Sensitive Habitat Area."

Serpentine Area Management

A qualified botanist should survey the serpentine area for a total of five years. Two visits should be made annually, one in late April and another in early June. Quantitative estimates should be made of the population sizes of special-status plants, including the federally endangered Santa Clara Valley dudleya (*Dudleya setchellii*) and the California Native Plant Society List 1B most beautiful jewelflower (*Streptanthus albidus* ssp. *peramoenus*) and the locations should be mapped. Quantitative estimates should also be made of the relative extent of native versus non-native cover. Annual reports, due July 15, should be submitted to the County, CDFG, and the USFWS. These reports should include any management recommendations for preserving native habitat values. The serpentine report would be included in the annual vegetation monitoring report for CordeValle, which would be produced for a period of five years.

9. Burrowing Owls

Assumed Impact. Project construction may adversely affect any future burrowing owl nests that may be established on the site prior to development. (Potential Significant Impact)

Original Mitigation. Preconstruction surveys would be conducted 30 days prior to site grading to ensure that no burrowing owl nests have been established, with implementation of appropriate mitigations if active nests are found. (Less-than-Significant Impact with Mitigation)

Monitored By. A report by a qualified biologist shall be submitted to Planning Office prior to the commencement of grading. If active burrowing owl nests are found during the breeding season, grading and construction would be subject to measures specified in the biologist's report.

Actual Impact. To LSA's knowledge, no preconstruction surveys were conducted, and no monitoring reports were submitted to the Planning Office. The CordeValle site contains good potential habitat for burrowing owls, and the species is known from other areas in Santa Clara County. However, the only confirmed report of burrowing owls on the CordeValle site was an observation in January 1988, during the non-breeding season. Because burrowing owls are relatively conspicuous and given the frequent visits to the site by LSA biologists in the period 1992 through 1998, it is unlikely that the birds were present but undetected. We presume that burrowing owls were not present during construction.

Adjusted Mitigation/Recommendations. No further action is recommended.

10. Raptor Nests

Assumed Impact. The project may adversely affect any future nests of the Golden Eagle or other raptors that could be established on the site prior to development. (Potential Significant Impact)

Original Mitigation. Preconstruction surveys would be conducted 30 days prior to site grading to ensure that no active eagle or raptor nests have been established on the site, with implementation of appropriate mitigations if active nests are found. (Less-than-Significant Impact with Mitigation)

Monitored By. Report by a qualified biologist shall be submitted to Planning Office prior to the commencement of grading. If active eagle or raptor nests are found during the breeding season, grading and construction would be subject to measures specified in the biologist's report.

Actual Impact. To LSA's knowledge, no preconstruction surveys were conducted and no monitoring reports were submitted to the Planning Office. We cannot determine if any impacts occurred.

Adjusted Mitigation/Recommendations. No further action is recommended.

11. Other Special-status Animals

Assumed Impact. The project would result in the reduction of on-site habitat for the ringtail, American badger, California horned lizard, and several species of raptor, all of which are special-status species which occur or potentially occur on the site. (Less-than-Significant Impact)

Original Mitigation. No mitigation required.

Monitored By. None required.

Actual Impact. These species are presumed absent from the CordeValle site.

Adjusted Mitigation/Recommendations. No further action is recommended.

12. Wetlands

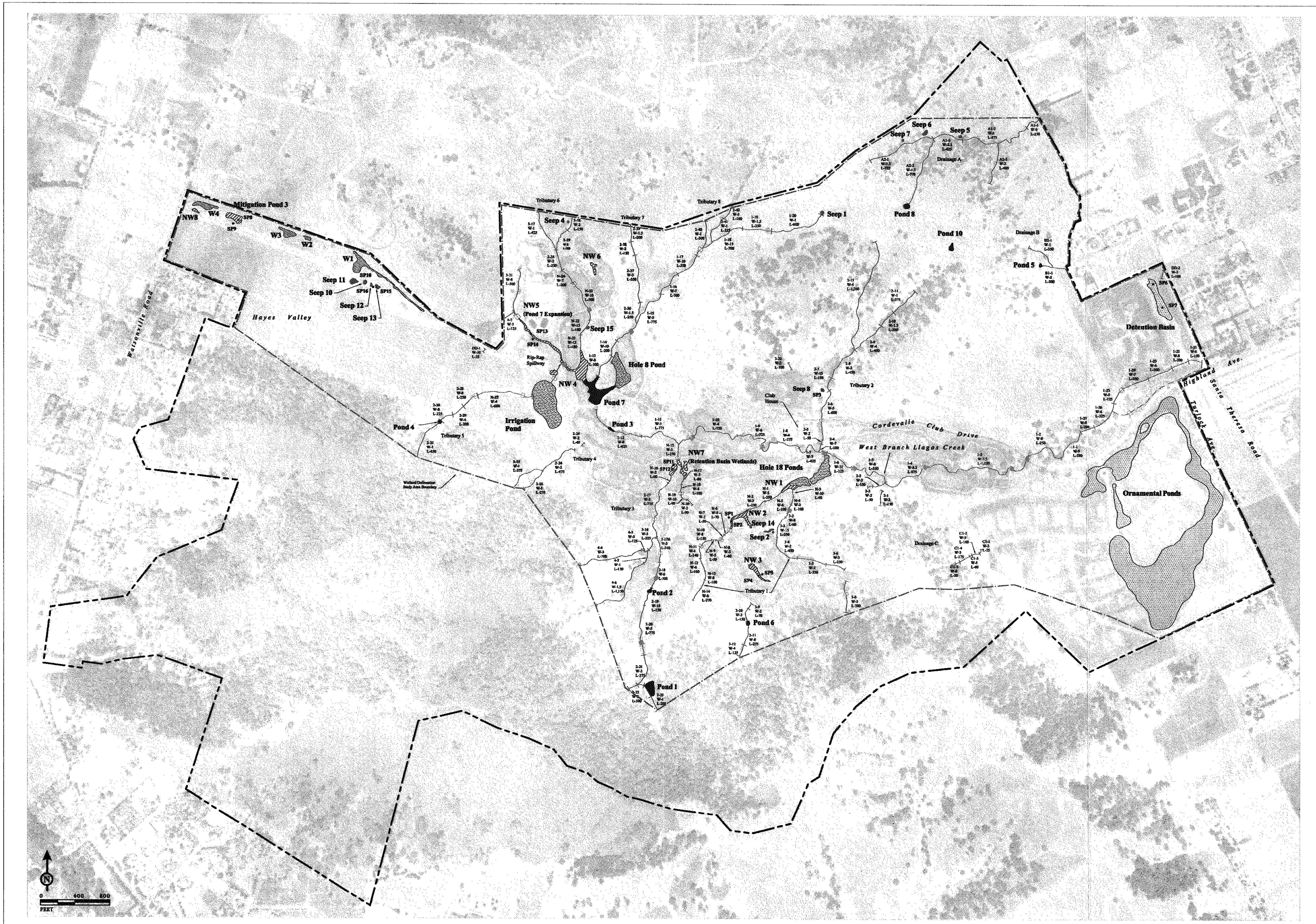
Assumed Impact. The project would eliminate approximately 1.2 acres of existing wetlands on the site. (Potential Significant Impact)

a. Original Mitigation. A detailed wetland protection, replacement and restoration plan would be prepared which meets with the approval of the County, the Corps of Engineers, and the Department of Fish and Game.

Monitored By. The final wetland mitigation plan, prepared by a qualified biologist, shall be submitted to Planning Office prior to issuance of the grading permit.

Actual Impact. To our knowledge, no final wetland mitigation plan had been submitted to the Planning Department. CordeValle was permitted to impact a total of 0.92 acre. Figure 3 illustrates current extent of jurisdictional wetlands and other waters on the CordeValle site. Based on LSA's post-construction investigations in 2003, the actual impact is 0.96 acre. Given the margin of error in measuring wetlands, we assume that the 0.92-acre and the 0.96-acre figures are essentially the same. Therefore, conclude that CordeValle was in compliance with its wetland fill limitations according to its permits with the CDFG and the U.S. Army Corps of Engineers.

At the mitigation ratio of 3:1 prescribed by the County, CordeValle's wetland creation obligation is 2.88 acres. However, CordeValle made a number of changes to its original construction plan, each with the new Section 1603 permit, results of which increased its mitigation obligations as summarized in the following table.



LSA

JURISDICTIONAL WATERS

STREAM SEGMENT
W-1' SEGMENT WIDTH
L-100' SEGMENT LENGTH
NW NEW WETLANDS
W NATURAL WETLANDS
STOCK POND
SEEPS
GOLF COURSE POND
CULVERT

NON-JURISDICTIONAL FEATURES

NON-JURISDICTIONAL WATER BODIES
CULVERT BYPASS CHANNEL

OTHER FEATURES

PROPERTY BOUNDARY
WETLAND DELINEATION STUDY AREA BOUNDARY
SP3 SAMPLE POINT
BRIDGES

FIGURE 3

CordeValle

Waters of the United States

PHOTOGRAPHIC BASE TAKEN AUGUST 12, 2003

P:\HVD330\g\JurisWet.dwg (9/18/03)

Table. Wetland mitigation acreage summary

Mitigation measure	Mitigation area required/proposed	Mitigation area present
Tributary 3 streams	4,645 sq. ft.	3,780 sq. ft.
Tributary 4 streams	540 sq. ft.	0 sq. ft.
Tributary 5 streams	1,883 sq. ft.	4,325 sq. ft.
Tributary 6 streams	4,022 sq. ft.	11,260 sq. ft.
Pond 7 expansion	30,070 sq. ft.	52,750 sq. ft.
Retention pond wetlands	36,115 sq. ft.	10, 100 sq. ft.
Lake A spillway	3,100 sq. ft.	5,705 sq. ft.
Pond 1 (CTS)	21,780 sq. ft.	0 sq. ft. (not built)
Pond 2 (WPT)	19,602 sq. ft.	0 sq. ft. (not built)
Pond 3 (seasonal wetland)	11,325 sq. ft.	12,365 sq. ft.
Pond 4 (CTS)	10,000 sq. ft.	0 sq. ft. (not built)
Pond 5 (CTS)	unspecified	0 sq. ft. (not built)
Llagas Creek culvert bypass channel	43,560 sq. ft.	0 sq. ft. (not built)
West Branch Llagas Creek	0	2,275 sq. ft.
Tributary 1 Streams	0	9,460 sq. ft.
Seep S14	0	560 sq. ft.
New Wetland 8	0	1,980 sq. ft.
Golf Course Wetlands	0	31,830 sq. ft.
Total	4.28 acre	3.36 acre

Adjusted Mitigation/Recommendations. LSA will be submitting an updated wetland delineation and a revised wetland mitigation plan. The conclusions of the wetland mitigation plan are incorporated herein by reference.

b. Original Mitigation. Best management practices would be used to manage and maintain the golf course in order to minimize impacts of pesticides, fertilizers and herbicides on the wetlands of the site.

Monitored By. Copies of permits from the Corps and DFG shall be submitted to Planning Office prior to the issuance of the grading permit.

Actual Impact. We do not have any knowledge that copies of the relevant permits were submitted. However, the County did grant grading permits, which implies that these permits were submitted.

Adjusted Mitigation/Recommendations. No further action is recommended.

c. Original Mitigation. A detailed erosion and sedimentation control plan would be prepared and implemented during project grading and construction. (Less-than-Significant Impact with Mitigation)

Monitored By. A qualified biologist shall annually monitor the survival of the replacement vegetation annually for a 5-year period and shall submit reports to Planning Office.

Actual Impact. We do not know of an erosion and sedimentation control plan being prepared or submitted to the Planning Office. Site inspection by LSA in July 2003 did not identify any erosion or sedimentation problems.

Adjusted Mitigation/Recommendations. A qualified biologist will be conducting annual monitoring of the revegetation effort for five years and will submit reports.

13. Invasive Plant Species

Assumed Impact. The introduction of non-native species to the site may adversely affect the native vegetation of the site. (Potential Significant Impact)

Original Mitigation. The use of invasive species in project landscaping would be avoided. (Less-than-Significant Impact with Mitigation)

Monitored By. Secretary of ASA.

Actual Impact. LSA's site inspection in July 2003 noted no invasive species used in the landscaping.

Adjusted Mitigation/Recommendations. No further action is recommended, although presence of invasive plant species, if detected, will be noted in the annual vegetation monitoring report along with appropriate control measures. A section to the CordeValle *Environmental Management*

Plan should be written, incorporating the prohibition of the use of invasive exotic plant species in the future.

H. ARCHAEOLOGY

1. Archaeological Site CA-SCL-76

Assumed Impact. The construction of the main project entrance road may have an adverse impact on the archaeological site recorded as CA-SCL-76. (Potential Significant Impact)

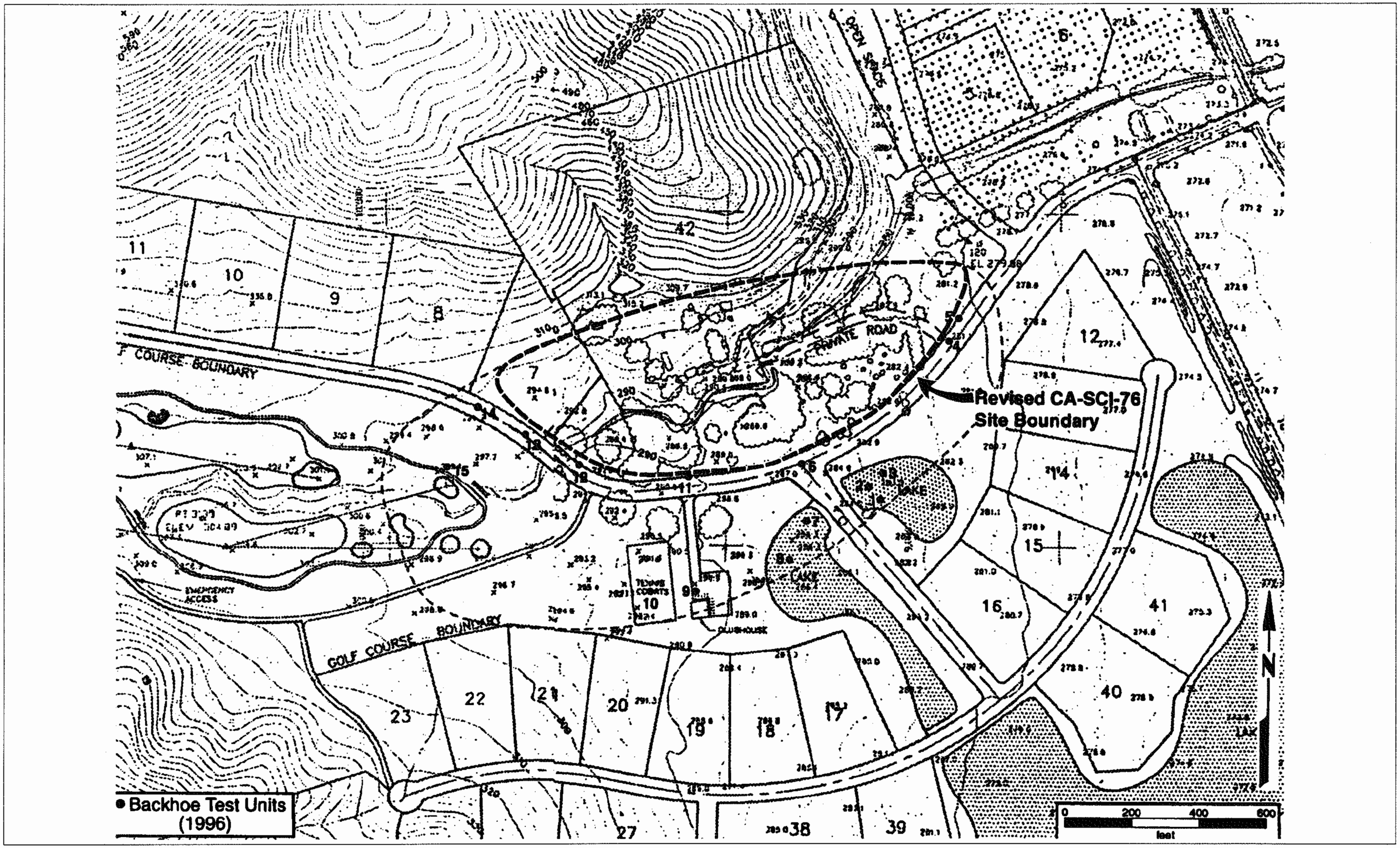
Original Mitigation. Grading and excavation in the vicinity of CA-SCL-76 would be subject to intermittent or spot monitoring by a qualified archaeologist. (Less-than-Significant Impact with Mitigation)

Monitored By. A post-excavation monitoring report prepared by a qualified archaeologist shall be submitted to the Planning Office, unless evidence of historic or prehistoric resources are discovered (see 2 below).

Actual Impact. To the best of LSA's knowledge, there has been no archaeological monitoring and consequently a post-excavation monitoring report was not prepared. LSA was not able to locate a post-excavation report. LSA conducted a records search at the Northwest Information Center (NWIC) of the California Historical Resources Information System, which is the official State of California Office of Historic Preservation repository for cultural resource records and reports. CordeValle management was contacted for any reports they might have in regards to archaeological monitoring. Also contacted was the archaeological consulting firm Basin Research Associates, Inc. (Basin Research), who had previously prepared reports for the CordeValle project (a.k.a. Lion's Gate). The County does not have an archaeological monitoring report on file for the CordeValle project (R. Eastwood, pers. com.).

In 1996 Basin Research prepared the report, *Mechanically Assisted Site Testing Program at CA-SCL-76 for a proposed Residential Project in Hayes Valley, South of Morgan Hill, Santa Clara County, California,* for a grading permit. This report had not previously been distributed, so was not on file at the NWIC or at the County. In September 2003, LSA was provided a copy of the 1996 report by Basin Research, and a copy has since been provided to the NWIC and to the County. The report documents Basin Research's field work to define the boundaries of archaeological site CA-SCL-76 (Figure 4). In their 1996 report, Basin Research stated that "an intermittent/spot monitoring program of construction in the vicinity of CA-SCL-76 is recommended for any subsurface disturbance below 12 inches (30 cm) within 25 feet (8 meters) of the revised site boundary . . ."

LSA is using the maps in the 1996 Basin Research report as the most recent definition boundary definition of site CA-SCL-76 (Figure 4). LSA conducted a surface field



LSA

FIGURE 4

CordeValle

Archaeological Site Proposed Development with Location of Backhoe Test Units and Revised CA-SCI-76 Site Boundary

SOURCE: BASIN RESEARCH ASSOCIATES, INC. (MARCH 1996).

review of the CordeValle project area on September 30, 2003, and noted that 1) the main entrance road and a building pad in lot #7 have been constructed in the vicinity of the documented boundaries of archaeological site CA-SCL-76 and 2) the documented boundaries of CA-SCL-76 have been encroached upon by road construction, installation of utilities, landscaping, and construction of a building pad in lot #7. There is the possibility that these activities adversely affected cultural resources.

Adjusted Mitigation/Recommendation.

Impacts to Portions of Lot #7 within the Site Boundary

Adverse effects to CA-SCL-76 by the already completed grading of a pad in lot #7 can be mitigated by the following treatment. Such mitigation should be limited to the area that has been cut and filled. A qualified professional archaeologist should conduct a review of the building pad and if archaeological materials have been affected, a mitigation program which would include screening the disturbed soils, collecting and analyzing the recovered archaeological materials, preparing a report, and curating the materials at a recognized storage facility should be developed and implemented. If prehistoric archaeological materials are present, a Native American monitor should be present during field work. Intact archaeological deposits should not be disturbed.

Other Potential Impacts to Site from Construction Activities

The past construction of the road, the landscaping, and installation of the utilities may have encroached on cultural resources within the defined boundary of site CA-SCL-76. However, mitigation would cause addition disturbance, while inaction would preserve potentially present cultural resources capped by the road and the landscaping. Because standard mitigation by excavation, analysis, and reporting would result in further disturbances to CA-SCL-76, it is not recommended. It is at the discretion of the County to require further mitigation for this past disturbance. No other authority can make this requirement, and there is no legal compulsion other than CEQA for further mitigation to be required.

Future Activities in the Vicinity of CA-SCL-76

If future ground disturbance is anticipated within the documented boundaries of CA-SCL-76, the archaeological site should first be evaluated for its eligibility for listing on the California Register of Historical Resources by a qualified professional archaeologist (a qualified professional archaeologist is one who meets the standards of a Registered Professional Archaeologist). Ground-disturbing activities may include, but are not limited to, excavation, augering, grading, dredging, clearing, grubbing, stump removal, and heavy equipment movement.

It is highly likely that CA-SCL-76 is eligible for the California Register. If CA-SCL-76 is eligible for the California Register, the archaeological site should be avoided by any activities that can cause adverse effects or such effects should be mitigated. If CA-SCL-76 is not eligible for the California Register, further study and protection of the site is not necessary (except for proper treatment of human remains, see below).

It is recommended that any ground disturbance within 25 feet of the documented boundaries of CA-SCL-76 be monitored by, or the monitoring conducted under the direction of, a qualified professional archaeologist. If any archaeological materials are identified during monitoring, the procedures in the above mentioned Basin Research report should be followed (see Basin Research 1996:page 10).

No further work should be done on lot #7 until an archaeologist has evaluated the situation. If CA-SCL-76 is eligible for the California Register (see above), a mitigation program should be developed for that portion of CA-SCL-76 that will be affected by development of lot #7, or CA-SCL-76 should be avoided by future construction or other ground-disturbing activities.

If further ground disturbing activities are planned for the vicinity of the site, it is further recommended that a cultural resource management plan be prepared, which will address the treatment of CA-SCL-76. Such a management plan would require a new boundary definition of CA-SCL-76.

2. Other Archaeologically Sensitive Areas

Assumed Impact. In the other areas of the site which are archaeologically sensitive, such as at the locations where prehistoric sites were previously recorded but where no archaeological material was found in recent surveys, there is a potential that buried archaeological resources may be damaged or destroyed by grading or excavation for the project. (Potential Significant Impact)

a. Original Mitigation. Should evidence of prehistoric cultural resources be discovered during construction, work in the immediate area of the find shall be stopped to allow adequate time for evaluation and mitigation, and a qualified professional archaeologist shall be called in to make an evaluation; the material shall be evaluated; and if significant, a mitigation program including collection and analysis of materials prior to the resumption of grading, preparation of a report, and curation of the materials at a recognized storage facility shall be developed and implemented under the direction of the Planning Office.

Monitored By. Upon completion of mitigation, a report by a qualified archaeologist shall be submitted to the Planning Office.

Actual Impact. In addition to site CA-SCL-76, there are three archaeologically sensitive areas that consist of the following sites: CA-SCL-77, -305/H, and -568.

- CA-SCL-77: LSA's review of a recent, August 2003, aerial photograph, as well as general field review of the CordeValle project area, indicated that no construction had occurred at this archaeologically sensitive location.

- CA-SCL-305/H: Field review by LSA on September 30, 2003, indicated that no construction has occurred at the recorded location of this prehistoric/historical archaeological site.

- CA-SCL-568: Field review by LSA on September 30, 2003, indicated that the entire recorded location of this prehistoric archaeological site has been affected by installation of a vineyard, fencing, a drain, and regular plowing.

Archaeological monitoring of these sensitive areas was not a mitigation requirement. The only area of archaeological sensitivity that has been affected is CA-SCL-568, and the mitigation protocol required contacting a qualified professional archaeologist only if prehistoric archaeological resources were discovered during construction. There has been no report that prehistoric cultural resources were encountered.

Adjusted Mitigation/Recommendations. Presumably there have been no impacts to prehistoric archaeological resources in these archaeologically sensitive areas. The original mitigation requirements should be followed if prehistoric and/or historical cultural resources are encountered in the future. It is further recommended that a cultural resource management plan, which will address the treatment of archaeologically sensitive areas, be developed for the CordeValle property,

b. Original Mitigation. In the event that human skeletal remains are encountered, the applicant is required by County Ordinance No. B6-18 to immediately notify the County Medical Examiner/Coroner (299-5137). Upon determination by the County Medical Examiner/Coroner that the remains are Native American, the Coroner shall contact the California Native American Heritage Commission, pursuant to subdivision (c) of section 7050.5 of the Health and Safety Code, and the County Coordinator of Indian Affairs. NO FURTHER DISTURBANCE OF SITE MAY BE MADE EXCEPT AS AUTHORIZED BY THE COUNTY MEDICAL EXAMINER/CORONER. If artifacts are found on the site, a qualified archaeologist shall be contacted, along with full compliance with section B6-19 of the Santa Clara County Code. (Less-than-Significant Impact with Mitigation)

Monitored By. Upon completion of mitigation, a report by a qualified archaeologist shall be submitted to the Planning Office.

Actual Impact. There has been no report that human skeletal remains have been encountered as a result of project activities.

Adjusted Mitigation/Recommendations. Implement the original mitigation if human skeletal remains are encountered in the future.

I. HISTORIC RESOURCES

1. Ranch Complex

Assumed Impact. Demolition and earth moving activity at the existing ranch complex could have a potentially adverse effect on any buried remnants of the Hispanic Period adobe structures that once occupied this site. (Potential Significant Impact)

Original Mitigation. Grading and excavation in the vicinity of the ranch complex would be subject to intermittent or spot monitoring by a qualified archaeologist, with appropriate mitigations implemented in the event that cultural materials are encountered. (Note: Since the potential adobe structures are believed to be located within prehistoric site SCL-76, this monitoring would occur concurrently with monitoring for archaeological resources at that site, as described above.) (Less-than-Significant Impact with Mitigation)

Monitored By. If Hispanic Period artifacts are discovered, and upon completion of mitigation, a report by a qualified architectural historian shall be submitted to the Planning Office.

Actual Impact. Site CA-SCL-76 is both an historical and a pre-historic cultural resource site. See it H.1 (above) for an analysis of actual impacts.

Adjusted Mitigation/Recommendation. Site CA-SCL-76 is both an historical and a pre-historic cultural resource site. See it H.1 (above) for an analysis of adjusted mitigation/recommendation.

N. HAZARDOUS MATERIALS, PUBLIC HEALTH AND SAFETY

1. Serpentine Hillside

Assumed Impact. Any unplanned construction or grading activity that encroaches upon the on-site serpentine hillside could result in the release of airborne particles of chrysotile asbestos, potentially causing a public health hazard if inhaled. (Potential Significant Impact)

Original Mitigation. To avoid disturbance to the serpentine bedrock area, the edge of this area would be fenced or roped-off to prevent encroachment by construction equipment. (Less-than-Significant Impact with Mitigation)

Monitored By. LDE&S.

Actual Impact. To LSA's knowledge, the edge of the serpentine bedrock area had not been fenced or roped-off during construction.

Adjusted Mitigation/Recommendations. We recommend that the serpentine area be fenced and posted even though construction has been completed.

2. Hazardous Materials

Assumed Impact. Improper use, and storage of hazardous materials used in the construction and operation of the golf course may result in potential soil or groundwater contamination. (Potential Significant Impact)

Original Mitigation. The project would be required to obtain and implement the provisions of a Hazardous Materials Storage Permit for the proper use, handling and storage of pesticides, herbicides and other hazardous products during construction and operation of the golf course. (Less-than-Significant Impact with Mitigation)

Monitored By. Department of Environmental Health, Hazardous Materials Compliance Division.

Actual Impact. To be addressed.

Adjusted Mitigation/Recommendations. To be addressed.

3. Equestrian Facility

Assumed Impact. The equestrian facility could result in potential vector and odor impacts. (Potential Significant Impact)

Original Mitigation. The equestrian facility would employ vector control measures, and would be operated in accordance with a manure management plan in conformance with State law, which would also be reviewed and approved by the County Department of Environmental Health. (Less-than-Significant Impact with Mitigation)

Monitored By. Department of Environmental Health.

Actual Impact. The equestrian facility has not been built, so there have been no impacts associated with it.

Adjusted Mitigation/Recommendations. Existing permits to build the equestrian center have expired. When and if a new equestrian center is proposed, it will come under the County's permitting authority at which time impacts and appropriate mitigation would be addressed.

P. WATER SUPPLY

1. On-site Water Demand

Assumed Impact. The proposed project would increase the demand for water at the site. (Potential Significant Impact)

a. Original Mitigation. Increased water supplies to meet project demand for domestic water would be provided by the West San Martin Water Works, without adversely affecting existing or future users.

Monitored By. Building Inspection Office.

Actual Impact. Twining is currently in the process of completing an inquiry with the San Martin Water Works. The assessment of impact, if any, not currently completed.

Adjusted Mitigation/Recommendations. To be addressed by Twining.

b. Original Mitigation. Water supplies for golf course irrigation would be provided by a combination of sources, including on-site pumping of groundwater, non-potable water from Twin Valley, Inc., and backup supplies from West San Martin Water Works. This water would be provided in a manner that would not exceed the safe yields of any of these sources. (Less-than-Significant Impact with Mitigation)

Monitored By. Building Inspection Office.

Actual Impact. Twining reports that the impact is unknown. The golf course utilizes two pumping wells for irrigation water supply. These wells are located on Highland Avenue: one is near the gate of the development at Turlock Avenue and the other is about a quarter mile to the east. Occasional water level measurements were made in the irrigation wells, however, these measurement were impacted by the pumping drawdown in the well and are not considered representative of the local water table. Groundwater surface level measurements have been monitored periodically in conjunction with the sampling of groundwater monitoring wells, however, only one of the monitoring wells (MW-5) appears to be close enough to the irrigation wells to be useful in monitoring aquifer drawdown. No safe yield monitoring program is known to have been established or conducted.

Adjusted Mitigation/Recommendations. It is recommended that a summary report of groundwater level measurements at the site be prepared. Based on the summary report a work plan for safe yield monitoring should be prepared. This would include establishment of a "safe" magnitude of water table drawdown, installation of monitoring piezometers and automated data acquisition equipment, and a schedule and procedures for on-going surface water level monitoring and reporting.

Q. WASTEWATER TREATMENT AND DISPOSAL

1. Wastewater Treatment and Disposal Demand

Assumed Impact. The proposed project would increase the demand for wastewater treatment and disposal facilities at the site. (Potential Significant Impact)

Original Mitigation. Increased wastewater from the project would be treated and disposed with new facilities to be constructed in conjunction with the project. (Less-than-Significant Impact with Mitigation)

Monitored By. Department of Environmental Health and Regional Water Quality Control Board.

Actual Impact. Wastewater from the project is treated at the wastewater treatment plant located southwest of the intersection of Turlock Road and Highland Avenue.

Adjusted Mitigation/Recommendations. None

2. Water Quality Degradation

Assumed Impact. The proposed wastewater disposal facilities may result in degradation of surface water and groundwater quality. (Potential Significant Impact)

Original Mitigation. Groundwater wells would monitor water quality up-gradient and down-gradient of the proposed spray irrigation area, with corrective action taken as necessary. (Less-than-Significant Impact with Mitigation)

Monitored By. Environmental Health (in conjunction with the Regional Water Quality Control Board). Copies of monitoring report by a registered civil engineer or licensed environmental health specialist shall be submitted to Environmental Health annually for the first 5 years.

Actual Impact. According to William Markum, wastewater treatment plant operator at CordeValle, three groundwater monitoring wells have been sampled and tested quarterly since January 2002. Mr. Markum also indicated to Twining that reports of the results have been submitted to the Regional Water Quality Control Board, and that it is his understanding that the WWTP is in compliance with the groundwater monitoring requirements. The monitoring program partially conforms to the *Groundwater and Surface Water Monitoring Plan* (May 8, 1997). However, the program has not included three of the six monitoring wells designated for monitoring in the *Groundwater and Surface Water Monitoring Plan*.

Adjusted Mitigation/Recommendations. The monitoring wells that have been destroyed should be replaced as indicated in section F. Water Quality, (4).

3. Reclaimed Wastewater

Assumed Impact. The use of reclaimed wastewater for golf course irrigation would expose humans to possible physical contact with the treated wastewater, resulting in a potential public health hazard. (Potential Significant Impact)

Original Mitigation. The wastewater would be treated to levels deemed acceptable for disposal on golf courses, and the areas affected would be posted to notify golfers and employees where irrigation by treated wastewater is occurring. (Less-than-Significant Impact with Mitigation)

Monitored By. Golf course superintendent. Department of Environmental Health.

Actual Impact. To be done by Twining.

Adjusted Mitigation/Recommendations. To be done by Twining.

4. Storage Reservoir Overflow

Assumed Impact. There is a potential for overflow of the storage reservoir, resulting in a public health hazard. (Potential Significant Impact)

Original Mitigation. The wastewater storage reservoir would have sufficient capacity to accommodate high rainfall years. (Less-than-Significant Impact with Mitigation)

Monitored By. LDE&S.

Actual Impact. An assessment of reservoir, including a review of reservoir design documents, is not currently completed.

Adjusted Mitigation/Recommendations. Pending complete review of the impact by Twining.

5. Odors

Assumed Impact. The wastewater treatment and disposal system could generate odors. (Potential Significant Impact)

Original Mitigation. Odor control would be achieved by mechanisms incorporated into the design of the pump stations and the treatment plant, and by measures to be undertaken at the effluent storage pond. (Less-than-Significant Impact with Mitigation)

Monitored By. Department of Environmental Health and Regional Water Quality Control Board.

Actual Impact. Assessment of actual impact of odors is currently in progress by Twining.

Adjusted Mitigation/Recommendations. Pending complete review of impact by Twining.

6. Mosquitoes

Assumed Impact. The existing pond and proposed open water areas of the project, such as the wastewater storage pond and residential lake, have the potential to be sites for breeding of mosquitoes, which could create a nuisance and a potential public health problem. (Potential Significant Impact)

Original Mitigation. Mosquito breeding would be controlled by several methods, as appropriate for each type of water body. These methods would include the circulation of water to prevent stagnant conditions, the introduction of mosquito fish, and the application of larvicide. The specific mosquito mitigation measures would be formulated in consultation with the Department of Environmental Health Vector Control District. (Less-than-Significant Impact with Mitigation)

Monitored By. Department of Environmental Health.

Actual Impact. Mosquitoes are effectively controlled primarily by biological methods. According to LSA's July 2003 inspection, mosquito fish were present in sufficient numbers in all open water bodies to control mosquitoes.

Adjusted Mitigation/Recommendations. No further action is recommended.

V. SOLID WASTE

1. Disposal of Solid Waste

Assumed Impact. The project would increase the generation of solid waste at the site, thereby reducing overall disposal capacity at local landfill sites. (Less-than-Significant Impact)

Original Mitigation. Provisions for recycling, composting and "grass cycling" would be incorporated into the project operation to reduce solid waste generation. (Less-than-Significant Impact)

Monitored By. An annual report by the golf course superintendent shall be submitted to Planning Office.

Actual Impact. To be done by LSA.

Adjusted Mitigation/Recommendations. To be done by LSA.

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FINAL

ENVIRONMENTAL IMPACT REPORT

LION'S GATE RESERVE

Lion's Gate Reserve
4039 Final EIR

Lead Agency: County of Santa Clara

File #4039-67-28-93
SCH #94043016

July 1996

TABLE OF CONTENTS

INTRODUCTION

This document, together with the Draft EIR, constitutes the Final EIR on the Lion's Gate Reserve, and includes the following: 1) text amendments to the DEIR; 2) a list of agencies, organizations and individuals who submitted written comments on the Draft EIR, and those who presented oral comments at the Planning Commission public hearing on May 2, 1996; 3) copies of the written comments received and summaries of the comments presented at the public hearing; and 4) responses to the written and oral comments.

An Environmental Impact Report is an informational document which, when fully prepared in accordance with the CEQA and State CEQA Guidelines, will inform public decision makers and the general public of the environmental effects of projects they propose to carry out or approve. The EIR process is intended to enable public agencies to evaluate a project to determine whether it may have a significant effect on the environmental, to examine and institute methods of reducing adverse impact, and to consider alternatives to the project as proposed. These things must the done prior to approval of the project. While CEQA requires that major consideration be given to preventing environmental damage, it is recognized that public agencies have obligation to balance other public objectives, including economic and social factors, in determining whether and how a project should be approved.

As defined in the State CEQA Guidelines, the standards for adequacy of an EIR are that it should be prepared with a sufficient degree of analysis to provide decision-makers with information that enables them to make a decision that intelligently takes into account environmental consequences. An evaluation of the environmental effects of a proposed project need not be exhaustive, but the sufficiency of an EIR is to be reviewed in light of what is reasonable feasible. Disagreement among experts does not make an EIR inadequate, but the EIR should summarize the main points of agreement. The courts have not looked for perfection, but for adequacy, completeness, and a good-faith effort at full disclosure

SUMMARY

A. PROJECT DESCRIPTION

The Lion's Gate site consists of a 1,676-acre site located west of the unincorporated community of San Martin in south Santa Clara County, approximately one mile south of Morgan Hill.

The proposed project consists of the following: 18-hole public access golf course with a clubhouse, a swim and tennis center, and 45 units of overnight accommodations; 41 lots for single-family dwellings; an equestrian center; and 1,265 acres to be maintained as permanent open space.

The discretionary approvals required for the project include: a General Plan Amendment to redesignate approximately 270 acres from "Agriculture-Medium Scale" to "Hillsides," along with the corresponding rezoning for this area; a Conditional Use Permit for the golf course and related facilities; two cluster subdivision approvals, one for 6 lots on a 32-acre Rural Residential parcel, and a second for a 35 lot Hillside cluster subdivision, and 1,265-acre permanent open space area.

B. SUMMARY OF IMPACTS AND MITIGATIONS

<u>IMPACT</u>	<u>MITIGATION</u>
A. LAND USE	
1. The project would result in a substantial alteration of the land use of the site. **(Less-than-Significant Impact)**	1. No mitigation required.
B. AGRICULTURE	
1. The development of the site would result in the loss of approximately 180 acres of Class II soils, including approximately 110 acres designated as "Prime Farmland" or "Farmland of Statewide Importance." **(Potential Significant Impact)**	1. The loss of approximately 110 acres of prime farmland would be offset by the planting of vineyards and/or orchards in areas not proposed for development. **(Less-than-Significant Impact with Mitigation)**
2. The residential lots proposed at the eastern end of the site would potentially create land use conflicts with nearby agricultural operations. **(Potential Significant Impact)**	2. The creation of buffer zones along the eastern edge of the site would minimize the interface conflicts with existing farming operations. **(Less-than-Significant Impact with Mitigation)**

IMPACT	MITIGATION

C. PARKS, RECREATION AND OPEN SPACE

IMPACT	MITIGATION
1. The conversion of portions of the site to golf course and residential uses would represent a substantial loss of semi-natural open space. **(Potential Significant Impact)**	1a. The project would provide approximately 263 acres of managed recreational open space in the form of a golf course. The golf course would provide an added recreational opportunity in the County. b. The remaining 1,265 acres of natural and semi-natural area of the site would be preserved as permanent open space as a condition of the cluster development permit. c. A trail easement for the 2 to 3 mile segment of the proposed San Martin Cross-Valley Trail would be dedicated in conjunction with the project. Segments of two additional trails along the project frontages on Coolidge Avenue and Watsonville Road would be dedicated and improved in conjunction with required roadway dedications and improvements. **(Less-than-Significant Impact with Mitigation)**

D. GEOLOGY AND SOILS

IMPACT	MITIGATION
1. Potential secondary ground rupture or sympathetic movement along inactive faults crossing the site may result in minor damage to structures, roadways and utility lines located directly over such features. **(Potential Significant Impact)**	1a. Where proposed structures for human occupancy are determined to be underlain by an inactive fault trace, appropriate setback distances for those structures may be required. b. Potential for rupture of water, wastewater or utility lines would be reduced by measures such as the use of pipes with flexible or telescoping couplings, double pipe and other measures. **(Less-than-Significant Impact with Mitigation)**
2. Strong ground shaking during an earthquake may damage buildings, bridges and other structures. **(Potential Significant Impact)**	2. Structural damage to buildings would be largely prevented by following the Uniform Building Code, as required. Bridges and other structures would be designed in accordance with seismic design loads, as determined by the project geologist. **(Less-than-Significant Impact with Mitigation)**

IMPACT	MITIGATION
D. GEOLOGY AND SOILS (CONT'D)	
3. Seismic shaking could induce ground failure resulting from liquefaction, potentially causing damage to buildings and other structures. **(Potential Significant Impact)**	3. If liquefiable material is found at building sites, mitigation would involve subexcavation of the liquefiable material and replacement with engineered fill, or alternative measures as recommended by the project geologic engineer. **(Less-than-Significant Impact with Mitigation)**
4. Seismic ground shaking could induce lateral spreading, potentially causing damage to buildings and other structures. **(Potential Significant Impact)**	4. The risk of damage from lateral spreading would be minimized by setting planned structures back a safe distance from stream banks, in accordance with the recommendations of the project geologist and geotechnical engineer. **(Less-than-Significant Impact with Mitigation)**
5. The presence of unstable slopes and landslide deposits on the project site may pose a hazard to some proposed structures, and may be affected by project grading, construction, and spray irrigation of treated effluent. **(Potential Significant Impact)**	5. Potential damage from landslides would be avoided by setting structures back from known landslide deposits, by repairing landslides, or by implementing other slope stabilization measures. **(Less-than-Significant Impact with Mitigation)**
6. Potential debris flows originating in the hillside areas of the site could cause damage to proposed structures and the golf course. **(Potential Significant Impact)**	6. Where a potential for debris flow is present, the hazard would be mitigated by removing accumulations of soil from the potential source areas, or by constructing debris deflection, channeling and containment facilities at the mouths of the potentially affected ravines. **(Less-than-Significant Impact with Mitigation)**
7. Expansive soils present on the site may cause movement or heaving, potentially resulting in damage to foundations, concrete slabs and pavements. **(Potential Significant Impact)**	7. Potential damage to foundations and pavements would be avoided or mitigated by following the requirements of the Uniform Building Code, and may necessitate removal of the expansive soils from areas where buildings, slabs-on-grade or pavements are planned to be constructed. **(Less-than-Significant Impact with Mitigation)**
8. Areas with potential soil creep may cause damage to foundations, concrete pads and pavements. **(Potential Significant Impact)**	8. Protection from potential surface sliding and soil creep would be provided by preventing surface water from draining onto potentially unstable slopes, through subsurface drainage control, and by providing for resistance to higher lateral pressures in the design of footings and walls. **(Less-than-Significant Impact with Mitigation)**

IMPACT	MITIGATION
D. GEOLOGY AND SOILS (CONT'D)	
9. Project grading and vegetation removal may result in erosion and sedimentation of downstream waterbodies. **(Potential Significant Impact)**	9. Erosion control practices would be implemented during grading and construction. (See text in Section *III. F. Water Quality* for details.) **(Less-than-Significant Impact with Mitigation)**
10. Shallow groundwater conditions in areas of the site may adversely affect below-ground structures and utilities. **(Potential Significant Impact)**	10. Groundwater problems would be minimized by avoiding construction during or just after the rainy season, and through implementation of grading and drainage measures to improve surface and subsurface drainage. **(Less-than-Significant Impact with Mitigation)**
11. Any unplanned grading or construction activity that encroaches upon the on-site serpentine hillsides could result in the release of airborne particulates of naturally-occurring chrysotile asbestos previously bound in the rock, potentially causing a public health hazard in the form of inhalation. **(Potential Significant Impact)**	11. The disturbance of the serpentine bedrock area, would be avoided by ensuring that no development or grading is planned for this area. In addition, the edge of this area would be flagged, fenced or roped-off to prevent inadvertent encroachment by construction equipment. **(Less-than-Significant Impact with Mitigation)**
E. HYDROLOGY AND DRAINAGE	
1. The project would potentially result in increased downstream flooding during the 100-year and 10-year storms. **(Potential Significant Impact)**	1. The on-site lake proposed for the southern residential cluster subdivision would be designed to provide sufficient detention storage for increased peak runoff resulting from site development. With this pond, the peak flow rates leaving the project site during the 100-year and the 10-year storms would be lower than under existing conditions. **(Less-than-Significant Impact with Mitigation)**
2. Portions of the residential cluster subdivisions would be subject to shallow flooding (one-foot average depth) during a 100-year event, and the proposed structures could also partially obstruct this sheet flow through the site. **(Potential Significant Impact)**	2. Potential impacts to the residential subdivisions from shallow flooding would be mitigated by constructing building pads on fills raised above flood elevations. The partial obstruction of shallow overland sheet flows by the proposed development would be mitigated by balancing fills with cuts within the flood-prone areas. **(Less-than-Significant Impact with Mitigation)**

IMPACT	MITIGATION
F. WATER QUALITY	
1. During grading and construction, erosion from exposed slopes, and pollutants from equipment may result in water quality impacts to downstream water bodies. **(Potential Significant Impact)**	1. The final golf course grading plan would be required to conform to all drainage and erosion control standards adopted by Santa Clara County and would require approval by the County. A comprehensive erosion control program and Storm Water Pollution Prevention Plan (SWPPP) would be required to be implemented during grading and construction (see text for details). **(Less-than-Significant Impact with Mitigation)**
2. After project completion, concentrated runoff from paved surfaces may result in isolated areas of erosion. **(Potential Significant Impact)**	2. Stormwater would be collected and dispersed in a manner to prevent concentrated flows, or outfall areas would be protected with channel armoring to prevent erosion and scouring. **(Less-than-Significant Impact with Mitigation)**
3. The project would generate nonpoint urban pollutants which may be carried in stormwater runoff from paved surfaces to downstream waterbodies. **(Potential Significant Impact)**	3. The project would include stormwater controls at the parking lots and maintenance facility. **(Less-than-Significant Impact with Mitigation)**
4. The project may result in water quality impacts to groundwater due to the use of fertilizers and pesticides on the golf course. **(Potential Significant Impact)**	4. The project would follow irrigation and chemical management practices under which application of water, fertilizers and chemicals would precisely meet plant needs, thus minimizing potential for leaching into the groundwater table. Monitoring wells would be installed to sample for the presence of golf course chemicals, with corrective action taken if necessary. **(Less-than-Significant Impact with Mitigation)**
5. The project may result in water quality impacts to surface water from fertilizers and pesticides used on the golf course. **(Potential Significant Impact)**	5. The potential for surface water quality impacts from golf course chemicals would be mitigated by infiltration into turf and rough areas, the use of grass filter strips, maintenance of setbacks for streams, and strategic installation of subdrains and retention basins. Surface water quality would be sampled and tested periodically, with corrective action taken if necessary. **(Less-than-Significant Impact with Mitigation)**

IMPACT	MITIGATION

F. WATER QUALITY (CONT'D)

6. The equestrian center could result in impacts to groundwater and surface water quality if manure or stall sweepings accumulate in stormwater runoff.
(Potential Significant Impact)

6. The equestrian center would be operated in accordance with a manure management plan and an erosion control plan; and runoff from the facility would be directed to an on-site retention pond.
(Less-than-Significant Impact with Mitigation)

7. The soils in the existing livestock corrals may contain accumulated nitrogenous compounds which could result in impacts to surface and groundwater quality.
(Potential Significant Impact)

7. The potentially affected soils would be sampled for nitrogen content and incorporated into the grading of the golf course in a manner that makes maximum benefit of the fertilizer value of the soil.
Less-than-Significant Impact with Mitigation)

[NOTE: The potential water quality impacts associated with wastewater disposal are discussed under *Q. Wastewater Treatment and Disposal*]

G. BIOLOGICAL RESOURCES

1. The project would involve the removal of 246 acres of non-native grasslands, orchards, cropland and residential landscaping.
(Less-than-Significant Impact)

1. No mitigation required. (Approximately 482 acres of grasslands would be included in the area to remain as permanent open space.)

2. Development of the two partially wooded lots (Lots 24 & 25) in the residential cluster subdivision in the southeastern portion of the site may result in the limited removal of valley oak woodland.
(Potential Significant Impact)

2. The removal of valley oak woodland within Lots 24 & 25 would be avoided to the extent feasible by placing the building envelopes in areas with relatively little tree cover. Any valley oaks which cannot be avoided by the future residential construction would be replaced at a ratio of 5:1.
(Less-than-Significant Impact with Mitigation)

3. The project would result in the loss of 0.83 acres of riparian vegetation or in the reduction of habitat quality in the riparian zone.
(Potential Significant Impact)

3. Impacts to the riparian habitat would be avoided to the extent feasible. The unavoidable loss of riparian vegetation and the reduction of habitat value would be mitigated by the on-site replacement of lost habitat, and by measures to protect and enhance the remaining habitat.
(Less-than-Significant Impact with Mitigation)

IMPACT	MITIGATION
G. BIOLOGICAL RESOURCES (CONT'D)	
4. The proposed golf course would result in the removal of up to 18 trees. **(Potential Significant Impact)**	4a. Existing trees would be preserved to the greatest extent possible. b. A tree replacement program would be prepared to provide for replacement of native trees removed by the project. c. Detailed guidelines would be prepared by a certified arborist to minimize potential damage to trees to be preserved. **(Less-than-Significant Impact with Mitigation)**
5. The main access road would cross the driplines of several oak trees near the proposed eastern bridge across West Branch Llagas Creek, potentially resulting in stress or damage to those trees. **(Potential Significant Impact)**	5. Grading and paving within the driplines of the affected oaks would be subject to the recommendations of a qualified arborist to minimize stress and damage, with replacement required for any trees that do not survive. **(Less-than-Significant Impact with Mitigation)**
6. The proposed project may result in direct impacts to the California tiger salamander, a special-status species, and would result in loss of breeding habitat for the tiger salamanders. **(Potential Significant Impact)**	6. The project would include measures to reduce direct mortality to the California tiger salamander, and measures to preserve existing habitat and create new habitat to replace the habitat lost due to the project. **(Less-than-Significant Impact with Mitigation)**
7. The proposed project may result in direct impacts to the western pond turtle, a special-status species, and would result in the loss of potential upland habitat for the pond turtle. **(Potential Significant Impact)**	7. The project would include measures to preserve existing pond turtle habitat, and to create new habitat on the project site. **(Less-than-Significant Impact with Mitigation)**
8. The special-status plant and invertebrate species of the serpentine grasslands on the site would be subject to potential disturbance by grading for the adjacent residential subdivision, and by the general intensification of human activity resulting from the project. **(Potential Significant Impact)**	8. The serpentine habitat area would be fenced, and signs would be posted to prevent encroachment of grading from the adjacent residential subdivision, and to prevent the incursion of human activities after the project is completed. **(Less-than-Significant Impact with Mitigation)**
9. Project construction may adversely affect any future burrowing owl nests that may be established on the site prior to development. **(Potential Significant Impact)**	9. Preconstruction surveys would be conducted 30 days prior to site grading to ensure that no burrowing owl nests have been established, with implementation of appropriate mitigations if active nests are found. **(Less-than-Significant Impact with Mitigation)**

IMPACT	MITIGATION
G. BIOLOGICAL RESOURCES (CONT'D)	
10. The project may adversely affect any future nests of the Golden Eagle or other raptors that could be established on the site prior to development. **(Potential Significant Impact)**	10. Preconstruction surveys would be conducted 30 days prior to site grading to ensure that no active eagle or raptor nests have been established on the site, with implementation of appropriate mitigations if active nests are found. **(Less-than-Significant Impact with Mitigation)**
11. The project would result in the reduction of on-site habitat for the ringtail, American badger, California horned lizard, and several species of raptor, all of which are special-status species which occur or potentially occur on the site. **(Less-than-Significant Impact)**	11. No mitigation required.
12. The project would eliminate approximately 1.2 acres of existing wetlands on the site. **(Potential Significant Impact)**	12a. A detailed wetland protection, replacement and restoration plan would be prepared which meets with the approval of the County, the Corps of Engineers, and the Department of Fish and Game. b. Best management practices would be used to manage and maintain the golf course in order to minimize impacts of pesticides, fertilizers and herbicides on the wetlands of the site. c. A detailed erosion and sedimentation control plan would be prepared and implemented during project grading and construction. **(Less-than-Significant Impact with Mitigation)**
13. The introduction of non-native species to the site may adversely affect the native vegetation of the site. **(Potential Significant Impact)**	13. The use of invasive species in project landscaping would be avoided. **(Less-than-Significant Impact with Mitigation)**
H. ARCHAEOLOGY	
1. The construction of the main project entrance road may have an adverse impact on the archaeological site recorded as CA-SCl-76. **(Potential Significant Impact)**	1. Grading and excavation in the vicinity of SCl-76 would be subject to intermittent or spot monitoring by a qualified archaeologist. **(Less-than-Significant Impact with Mitigation)**

IMPACT	MITIGATION

H. ARCHAEOLOGY (CONT'D)

2. In the other areas of the site which are archaeologically sensitive, such as at the locations where prehistoric sites were previously recorded but where no archaeological material was found in recent surveys, there is a potential that buried archaeological resources may be damaged or destroyed by grading or excavation for the project.
(Potential Significant Impact)

2a. Should evidence of prehistoric cultural resources be discovered during construction, work in the immediate area of the find shall be stopped to allow adequate time for evaluation and mitigation, and a qualified professional archaeologist shall be called in to make an evaluation; the material shall be evaluated; and if significant, a mitigation program including collection and analysis of materials prior to the resumption of grading, preparation of a report, and curation of the materials at a recognized storage facility shall be developed and implemented under the direction of the Planning Office.

b. In the event that human skeletal remains are encountered, the applicant is required by County Ordinance No. B6-18 to immediately notify the County Medical Examiner/Coroner (299-5137). Upon determination by the County Medical Examiner/Coroner that the remains are Native American, the Coroner shall contact the California Native American Heritage Commission, pursuant to subdivision (c) of section 7050.5 of the Health and Safety Code, and the County Coordinator of Indian Affairs. NO FURTHER DISTURBANCE OF SITE MAY BE MADE EXCEPT AS AUTHORIZED BY THE COUNTY MEDICAL EXAMINER/CORONER. If artifacts are found on the site, a qualified archaeologist shall be contacted, along with full compliance with section B6-19 of the Santa Clara County Code.
(Less-than-Significant Impact with Mitigation)

IMPACT	MITIGATION

I. HISTORIC RESOURCES

IMPACT	MITIGATION
1. Demolition and earth moving activity at the existing ranch complex could have a potentially adverse effect on any buried remnants of the Hispanic Period adobe structures that once occupied this site. **(Potential Significant Impact)**	1. Grading and excavation in the vicinity of the ranch complex would be subject to intermittent or spot monitoring by a qualified archaeologist, with appropriate mitigations implemented in the event that cultural materials are encountered. (Note: Since the potential adobe structures are believed to be located within prehistoric site SCl-76, this monitoring would occur concurrently with monitoring for archaeological resources at that site, as described above.) **(Less-than-Significant Impact with Mitigation)**

J. VISUAL AND AESTHETICS

IMPACT	MITIGATION
1. The project would result in visual changes to some areas of the site open to public view. **(Less-than-Significant Impact)**	1. The project would be designed and landscaped in a manner to help it blend in with the natural and rural surroundings, and to reduce its visibility from off-site locations. **(Less-than-Significant Impact with Mitigation)**
2. Lighting for the project entrance, clubhouse, swim and tennis center, equestrian center, parking areas and internal roadways may produce light and glare at off-site locations. Reflective building materials may also produce glare. **(Potential Significant Impact)**	2. Project lighting would be sited and designed to minimize off-site light and glare. The project structures would be composed of non-reflective building materials and non-glare windows **(Less-than-Significant Impact with Mitigation)**
3. Grading, vegetation removal and construction activity would result in temporary scarring. Storage of construction equipment and materials may be visible from off-site locations. **(Potential Significant Impact)**	3. Graded areas would be revegetated as soon as possible, and screening berms would be created along the project frontage prior to construction of the dwellings in the proposed residential subdivisions. **(Less-than-Significant Impact with Mitigation)**

IMPACT	MITIGATION

K. TRAFFIC AND CIRCULATION

IMPACT	MITIGATION
1. The project would result in increased traffic generation at the project site. **(Less-than-Significant Impact)**	1. No mitigation required.
2. The project would increase the on-site parking required for the project site. **(Less-than-Significant Impact)**	2. No mitigation required. (The proposed site plans indicate that adequate on-site parking would be provided in accordance with the County Parking Standards.)

L. NOISE

IMPACT	MITIGATION
1. Traffic generated by the project would increase noise levels at existing residences. **(Less-than-Significant Impact)**	1. No mitigation required.
2. Portions of the 2 lots proposed in the vicinity of Coolidge Avenue would be exposed to traffic noise levels in excess of the 55 dBA L_{dn}, the County standard for residential uses. (However, under the proposed subdivision plan for this area, the minimum setbacks for dwellings on these lots would place them beyond the zone of potential noise impact.) **(Less-than-Significant Impact)**	2. No mitigation required.
3. Noise generated by golf course mowers would have a potentially adverse effect on nearby dwellings proposed on the project site. **(Potential Significant Impact)**	3. The hours of mowing within 330 feet of any proposed residence would be restricted to weekdays between the hours of 8:00 a.m. and 5:00 p.m., with total noise generating activities within any hour restricted in accordance with the limits set forth in the County's Noise Ordinance. **(Less-than-Significant Impact with Mitigation)**
4. Activities at the clubhouse would increase noise levels in the interior of Hayes Valley. **(Less-than-Significant Impact)**	4. No mitigation required.
5. Noise levels would be temporarily elevated during project grading and construction. **(Potential Significant Impact)**	5. Short-term construction noise impacts would be reduced through compliance with the County's Noise Ordinance with respect to hours of operation and maximum noise levels at adjacent property lines. **(Less-than-Significant Impact with Mitigation)**

IMPACT	MITIGATION

M. AIR QUALITY

IMPACT	MITIGATION
1. Construction and grading for the project may generate dust and exhaust emissions that could adversely affect local and regional air quality. **(Potential Significant Impact)**	1. Effective measures would be implemented to reduce construction-related emissions (see text for details). **(Less-than-Significant Impact with Mitigation)**
2. Traffic generated by the project would increase carbon monoxide emissions at local roadways and intersections. **(Less-than-Significant Impact)**	2. No mitigation required.
3. Emissions from project-generated traffic would result in air pollutant emissions affecting the entire San Francisco Bay air basin. **(Less-than-Significant Impact)**	3. No mitigation required.

N. HAZARDOUS MATERIALS, PUBLIC HEALTH AND SAFETY

IMPACT	MITIGATION
1. The historic and current agricultural activities on the Hayes Valley Ranch may have resulted in potential soil contamination due to spilled or leaked hydrocarbon products, pesticides and herbicides, PCBs from electrical transformers, and other potential sources of contamination. The existing residential structures may include materials that contain asbestos. **(Potential Significant Impact)**	1. Prior to demolition of the existing ranch structures and site grading, the areas identified as having potential soil or asbestos contamination would be sampled and tested to determine whether contaminants are present in hazardous concentrations. Any soils which are found to be contaminated would be subject to remediation measures, as appropriate. If asbestos-containing materials are found to be present, they would be removed in the manner specified by law. **(Less-than-Significant Impacts with Mitigation)**
2. Any unplanned construction or grading activity that encroaches upon the on-site serpentine hillside could result in the release of airborne particles of chrysotile asbestos, potentially causing a public health hazard if inhaled. **(Potential Significant Impact)**	2. To avoid disturbance to the serpentine bedrock area, the edge of this area would be fenced or roped-off to prevent encroachment by construction equipment. **(Less-than-Significant Impact with Mitigation)**
3. Improper use, handling and storage of hazardous materials used in the construction and operation of the golf course may result in potential soil or groundwater contamination. **(Potential Significant Impact)**	3. The project would be required to obtain and implement the provisions of a Hazardous Materials Storage Permit for the proper use, handling and storage of pesticides, herbicides and other hazardous products during construction and operation of the golf course. **(Less-than-Significant Impact with Mitigation)**

IMPACT	MITIGATION

N. HAZARDOUS MATERIALS, PUBLIC HEALTH AND SAFETY (CONT'D)

IMPACT	MITIGATION
4. The equestrian facility could result in potential vector and odor impacts. **(Potential Significant Impact)**	4. The equestrian facility would employ vector control measures, and would be operated in accordance with a manure management plan in conformance with State law, which would also be reviewed and approved by the County Department of Environmental Health. **(Less-than-Significant Impact with Mitigation)**

O. ELECTROMAGNETIC FIELDS (EMFs)

IMPACT	MITIGATION
1. The siting of residential lots in the vicinity of existing high-voltage power lines may potentially expose future residents to increased levels of electromagnetic fields. **(Less-than-Significant Impact)**	1. No mitigation required.

P. WATER SUPPLY

IMPACT	MITIGATION
1. The proposed project would increase the demand for water at the site. **(Potential Significant Impact)**	1a. Increased water supplies to meet project demand for domestic water would be provided by the West San Martin Water Works, without adversely affecting existing or future users. b. Water supplies for golf course irrigation would be provided by a combination of sources, including on-site pumping of groundwater, non-potable water from Twin Valley, Inc., and backup supplies from West San Martin Water Works. This water would be provided in a manner that would not exceed the safe yields of any of these sources. **(Less-than-Significant Impact with Mitigation)**

Q. WASTEWATER TREATMENT AND DISPOSAL

IMPACT	MITIGATION
1. The proposed project would increase the demand for wastewater treatment and disposal facilities at the site. **(Potential Significant Impact)**	1. Increased wastewater from the project would be treated and disposed with new facilities to be constructed in conjunction with the project. **(Less-than-Significant Impact with Mitigation)**
2. The proposed wastewater disposal facilities may result in degradation of surface water and groundwater quality. **(Potential Significant Impact)**	2. Groundwater wells would monitor water quality up-gradient and down-gradient of the proposed spray irrigation area, with corrective action taken as necessary. **(Less-than-Significant Impact with Mitigation)**

IMPACT	MITIGATION

Q. WASTEWATER TREATMENT AND DISPOSAL (CONT'D)

IMPACT	MITIGATION
3. The use of reclaimed wastewater for golf course irrigation would expose humans to possible physical contact with the treated wastewater, resulting in a potential public health hazard. **(Potential Significant Impact)**	3. The wastewater would be treated to levels deemed acceptable for disposal on golf courses, and the areas affected would be posted to notify golfers and employees where irrigation by treated wastewater is occurring. **(Less-than-Significant Impact with Mitigation)**
4. There is a potential for overflow of the storage reservoir, resulting in a public health hazard. **(Potential Significant Impact)**	4. The wastewater storage reservoir would have sufficient capacity to accommodate high rainfall years. **(Less-than-Significant Impact with Mitigation)**
5. The wastewater treatment and disposal system could generate odors. **(Potential Significant impact)**	5. Odor control would be achieved by mechanisms incorporated into the design of the pump stations and the treatment plant, and by measures to be undertaken at the effluent storage pond. **(Less-than-Significant Impact with Mitigation)**
6. The existing pond and proposed open water areas of the project, such as the wastewater storage pond and residential lake, have the potential to be sites for breeding of mosquitoes, which could create a nuisance and a potential public health problem. **(Potential Significant Impact)**	6. Mosquito breeding would be controlled by several methods, as appropriate for each type of water body. These methods would include the circulation of water to prevent stagnant conditions, the introduction of mosquito fish, and the application of larvacides. The specific mosquito mitigation measures would be formulated in consultation with the Department of Environmental Health Vector Control District. **(Less-than-Significant Impact with Mitigation)**

R. FIRE PROTECTION

IMPACT	MITIGATION
1. Portions of the project site are located in areas designated as Extreme or Moderate Fire Hazard areas, and thus may be subject to loss of life and property in the event of a wildland fire. **(Potential Significant Impact)**	1. The project would be required to implement the County Fire Marshal's conditions for fire protection, including minimum roadway standards, adequate water storage and pressure for fire fighting, installation of hydrants and automatic sprinklers, vegetation clearance and building specifications. **(Less-than-Significant Impact with Mitigation)**

IMPACT	MITIGATION
S. POLICE AND SECURITY	
1. The project may result in increased demand for police services at the site. **(Less-than-Significant Impact)**	1. No mitigation required.
T. SCHOOLS	
1. The proposed residential subdivisions would generate 32 school-aged children within the Morgan Hill Unified School District, where the schools are already impacted. **(Potential Significant Impact)**	1. The project's impacts to schools would be mitigated by the state-mandated school impact fee charged to the builder, and by the property tax increment for schools to be paid by the future homeowners under the existing Mello-Roos district that includes the Lion's Gate site. **(Less-than-Significant Impact with Mitigation)**
U. UTILITIES	
1. The project would increase demand for electric power, natural gas and telephone service at the site. **(Less-than-Significant Impact)**	1. No mitigation required.
V. SOLID WASTE	
1. The project would increase the generation of solid waste at the site, thereby reducing overall disposal capacity at local landfill sites. **(Less-than-Significant Impact)**	1. Provisions for recycling, composting and "grass cycling" would be incorporated into the project operation to reduce solid waste generation. **(Less-than-Significant Impact)**
W. ENERGY	
1. The project would result in the consumption of non-renewable energy resources in both the construction and operational phases of the project. **(Less-than-Significant Impact)**	1. Energy conservation measures would be incorporated into the project in accordance with Title 24 of the California Administrative Code. The project would also incorporate other energy-efficient features in building design and construction, and in the operation of the irrigation system. **(Less-than-Significant Impact)**

I. LIST OF AGENCIES, ORGANIZATIONS AND INDIVIDUALS COMMENTING ON THE LION'S GATE RESERVE EIR

	Written Comments Received From	Response Required?
A.	California Department of Fish and Game	Yes
B.	California Native Heritage Commission	Yes
C.	California Regional Water Quality Control Board - Central Coast Region	Yes
D.	California Department of Toxic Substances Control	Yes
E.	California Department of Transportation	Yes
F.	Santa Clara Valley Water District	Yes
G.	County of Santa Clara Department of Environmental Health	Yes
H.	County of Santa Clara Integrated Waste Management Program	Yes
I.	County of Santa Clara Parks and Recreation Department	No
J.	County of Santa Clara Planning Commissioner Thomas Kruse	Yes
K.	County of Santa Clara Roads and Airports Department	Yes
L.	City of Morgan Hill	Yes
M.	Committee for Green Foothills	Yes
N.	Greenbelt Alliance	Yes
O.	Santa Clara County Audubon Society	Yes
P.	Sierra Club - Loma Prieta Chapter	Yes
Q.	Colliers Parrish International	No
R.	Forst Commercial Real Estate	No
S.	Moison Investment Company	No
T.	Twin Valley, Inc.	No
U.	John and Chris Ambrose	Yes

Written Comments Received From		Response Required?
V.	Ernie Donato	Yes
W.	Timothy Duff	Yes
X.	Lyle and Esther Hughes	No
Y.	Doug Marlitt	Yes
Z.	Jeffrey Martin	Yes
Z1.	Shelley E. Moeller	Yes
Z2.	Dwayne and Cathy Turpin	Yes
Z3.	Royanne Ukestad	No

Comments Presented at the Planning Commission Hearing on the DEIR, May 2, 1996

AA.	Julia Bott, Sierra Club	Yes
BB.	Camas Hubenthal, Committee for Green Foothills	Yes
CC.	Vicki Moore, Greenbelt Alliance	Yes
DD.	Pat Forst, Forst Commercial Real Estate	Yes
EE.	Craig Breon, Santa Clara County Audubon Society	Yes
FF.	Steve Havens, Twin Valley, Inc.	Yes
GG.	Bob Murphy, Northern California Golf Association	No
HH.	Bob Ukestad, West San Martin Water Works	No
II.	Royanne Ukestad	No
JJ.	Chris Williams	No
KK.	John Ambrose	Yes
LL.	Tom Kruse, Planning Commissioner	Yes
MM.	Brent Ventura, Planning Commissioner	Yes
NN.	Tom Tanner, Planning Commissioner	Yes

II. OVERVIEW OF MAIN ISSUES DISCUSSED IN COMMENTS ON DEIR

A. WATER SUPPLY

General Overview of Issue

Given the large volume of water needed to irrigate the golf course, concerns have been raised as to whether sufficient water supply can be drawn from the local aquifers without resulting in overdraft of the groundwater resource, potentially resulting in impacts to other wells in the vicinity.

Background

As discussed in Section III. P. of the DEIR, the Lion's Gate project would rely on three sources of supply for irrigation water. These include pumping on-site groundwater as the primary source, and obtaining supplemental water supply from West San Martin Water Works and Twin Valley, Inc.

In order to establish that adequate water supply can in fact be obtained from these sources, Geoconsultants, Inc., prepared two preliminary water availability studies that determined the probable safe yield from these three sources (see Appendix M of the DEIR). The first study conservatively estimated the average daily safe yield for on-site groundwater to be 280,000 gallons per day. For West San Martin Water Works, the safe yield was estimated to be 480,000 gallons per day above current usage rates, and the safe yield for Twin Valley, Inc. was estimated to be 14,000 gallons per day over current usage rates. Since the average daily irrigation demand from the project is estimated to be 334,000 gallons per day, it is clear that sufficient water supply is available from the combination of sources to provide for the irrigation needs of the golf course. (The Santa Clara Valley Water District, in a memo dated June 26, 1996, has indicated its concurrence that there is sufficient water available for the project. This memo has been added to the EIR and is included in *Section V. REVISIONS TO THE APPENDICES OF THE EIR.)* The Geoconsultants report stated that the impact of on-site groundwater pumping on down-gradient wells would be minimal provided that the on-site irrigation wells were located a prudent distance from the eastern boundary of the site. Given the large size of the Lion's Gate site, there is no doubt that adequate setbacks for on-site production wells can be provided.

Major Comments and Responses

1. **The Geoconsultants study shows that average daily water demand would be less than average daily safe yield from on-site groundwater. What assurance is there that the higher rates of on-site groundwater pumping during the summer months will not have an impact on the groundwater and on neighboring wells down-gradient.**

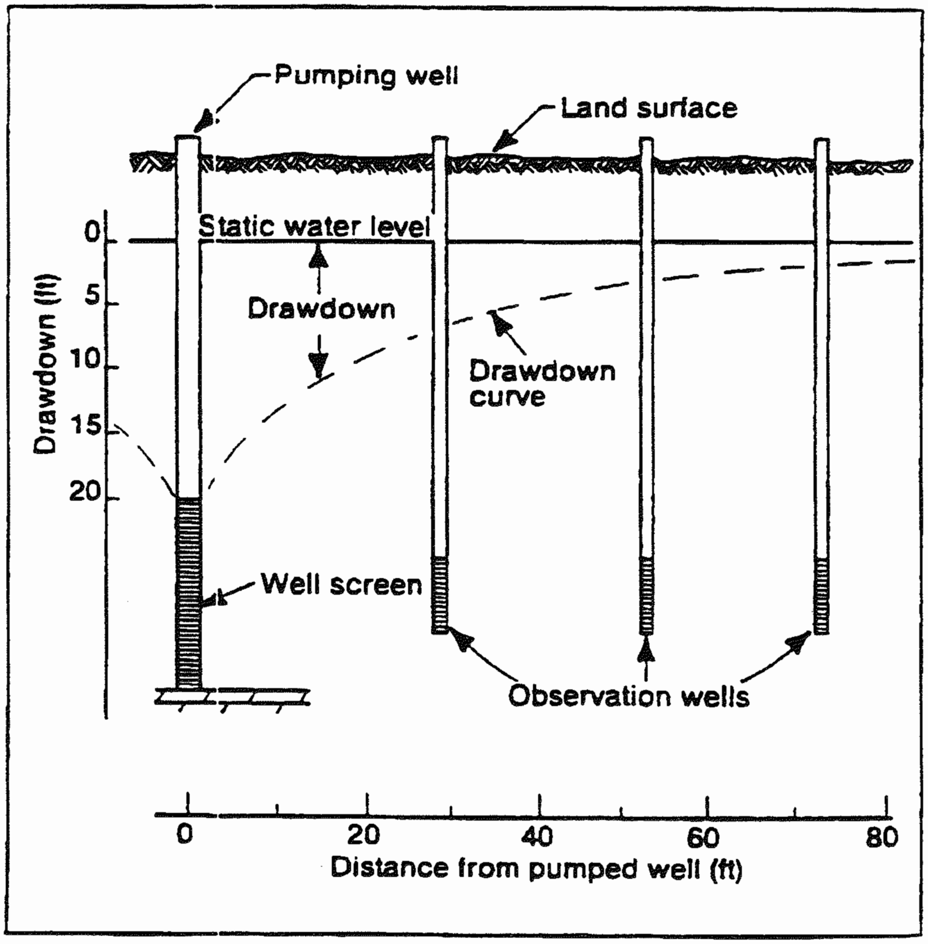
   Response

   The calculation of average daily yield is based on the total volume of groundwater available for the entire year. Thus it takes into account periods of very low demand, such as winter, when groundwater supplies could be said to be banked for higher demand periods in summer when pumping rates would exceed the average daily safe yield.

   However, it is clear that the average daily safe yield of 280,000 gallons per day is not sufficient to meet the average daily irrigation demand of 334,000 gallons per day. Thus off-site water sources are needed to prevent impacts to the on-site aquifer. The question then becomes how to determine when on-site pumping should be reduced or suspended to prevent such impacts. This would initially be calculated based on information obtained during the detailed engineering-level water supply investigations (see item 4 below for a full description). There are several reasons why such detailed studies are not warranted at this stage in the development approval process. First, there is no doubt on the part of Geoconsultants that there is adequate water supply available for the project, even under prolonged drought conditions. Secondly, there is no doubt on the part of Geoconsultants that impacts to downgradient wells can be readily avoided by placement of production wells a prudent distance from the eastern project boundary. These issues are discussed in detail below. Since these threshold issues of concern to the EIR have been settled based on preliminary studies, there is no need to undertake the detailed engineering-level water supply investigations at this stage. Since the applicant has not yet received any discretionary project approvals from the County, it would impose an unreasonable financial risk on the applicant to require detailed engineering studies at this stage, which would also be premature from a technical standpoint. The optimum time to undertake detailed water supply investigations would be in the fall when the groundwater table has reached a static condition and is no longer under the influence of the previous winter's rainfall.

The prevention of overpumping would be assured by the installation of a down-gradient monitoring well on the site which would be monitored constantly during peak pumping periods to observe any drawdown in the water table (see diagram below). This would provide an indication of when to suspend on-site pumping and start drawing exclusively from the supplemental sources. In addition, existing off-site wells would also be monitored to ensure that impacts are not occurring to these wells.

After the system has been in operation for a period of time, the project geohydrologist would obtain a more refined knowledge of the aquifer based on rainfall and pumping records. This would provide the basis for predicting available on-site groundwater for a given year, including drought years, based on the previous winter's rainfall.



2. **What assurance is there that adequate water supplies would exist for the project during severe and prolonged drought conditions.**

Response

Under severe drought conditions, it is reasonable to assume that little or no water would be available from on-site groundwater or Twin Valley, Inc. Thus all of the irrigation water supply for the project would have to be supplied by West San Martin Water Works. According to the Geoconsultants report of February 20, 1996 (contained in Appendix M of the DEIR), WSMWW has more than sufficient surplus safe yield to provide for all of the project's irrigation requirements.

The water company draws from three 400-foot deep wells in central San Martin, and no difficulties whatsoever were experienced by the water company during the last drought, so no rationing program had to be implemented. During the height of the drought, water levels in the Llagas groundwater basin dropped only to 112 feet below the ground surface, far above the level of the water company's pump. It is also worth noting that the overall water demand in the West San Martin service area has actually declined over the years with the reduction in agricultural irrigation.

In the event of a prolonged drought, a drought contingency plan would be instituted at the golf course to reduce irrigation water demand. As discussed on page 189 of the DEIR, water usage at the golf course would be cut back in phases. As a drought develops and/or water supplies diminish, irrigation applications would first be reduced in less critical areas such as fairways. As conditions worsen, irrigation of fairways would be further reduced or suspended altogether, depending on the severity of the drought. During this time, irrigation would also be reduced on higher priority areas such as tees and fairway landing areas, to a level which would still maintain plant life, but at a severely stressed level. The greens would be the last to have reduced irrigation because they include the most critical turfgrass, and because they make up only about 4 percent of the total irrigated acreage.

3. **Since the safe-yield study for the on-site aquifer was based on data from 1971, the estimated safe-yield should be recalculated based on recent rainfall data that takes into account the last two droughts.**

Response

The rainfall information cited from Rantz (1971) consisted of an isohyetal (rainfall contour) map of the greater Bay Area. The precipitation values were based on specific gauges throughout the area, and represent average rainfall for the 50-year period between 1906 and 1956. Although this study has not been updated since then, the gauges have continued to monitor rainfall. There is no precipitation gauge presently installed at the site; however, a gauge in Gilroy has determined average annual rainfall to be 20 inches for the period of 1956 through 1994. Rantz's isohyetal map showed rainfall at Gilroy to also be 20 inches for the period from 1906 to 1956. Therefore, due to the close proximity of Gilroy to the site, it can be assumed that the annual rainfall for Hayes Valley has also continued to be the same (at 21 inches) since 1956. Therefore, the safe-yield estimate for on-site groundwater is based on reliable rainfall data.

4. **Detailed aquifer studies, including pump tests, should be performed now to verify that adequate water supply exists, and to specify the locations of production wells to ensure that no impacts would occur to off-site wells.**

Response

There is no doubt in the part of Geoconsultants that more than sufficient water supplies are available to serve the project from on-site groundwater in combination with supplemental supplies from West San Martin Water Works. In fact, the West San Martin Water Works has sufficient reserves that it could serve all of the irrigation needs of the project without adversely affecting existing or future customers. (The Santa Clara Valley Water District, in a memo dated June 26, 1996, has indicated it concurrence that there is sufficient water available for the project. This memo has been added to the EIR and is included in Section *VI. REVISIONS TO THE APPENDICES OF THE EIR.)* As noted in the recent letter from the Water Company that has been added to Appendix M of the EIR, the bulk rate for irrigation water would be approximately one-third the rate for domestic water. In addition, Twin Valley, Inc. indicates in its letter (see Comment T) that it can provide up to 120,000 gallons per day to the Lion's Gate project. This reflects historic pumping rates from two wells which are no longer used because nitrate levels slightly exceed 1996 Safe Drinking Water Act standards. As such, two new deep wells were drilled to provide domestic water for Twin Valley's existing customers. Although Twin Valley, Inc. indicates that it can provide 120,000 gallons per day, the preliminary study by Geoconsultants conservatively estimated a total safe yield of 110,000 gallons per day from this aquifer, of which 96,000 gallons would be used by existing Twin Valley customers, leaving 14,000 gallons per day for the Lion's Gate project. This estimate was based on very conservative assumptions since a detailed field investigation was not undertaken; thus the actual remaining safe yield is expected to be somewhat greater.

In order to determine with greater precision the on-site safe yield for groundwater pumping, additional studies will be required prior to construction to define the characteristics of the aquifer. This detailed investigation would also determine the number of production wells needed, and their optimum locations, and in particular would establish setback distances for these new wells to ensure that they do not have an impact on off-site wells. There is no doubt on the part of Geoconsultants that there is sufficient area available on the site so that the required production well(s) can be placed in locations where they will not result in off-site impacts.

For purposes of the EIR, the Geoconsultants studies have sufficiently established that adequate water supply is available for the project without resulting in impacts to the resource or other wells. Therefore, although more detailed studies will be required at the detailed project design stage, they are not warranted for the EIR.

It should also be noted that in the event of prolonged drought, water usage would be cut back in phases as prescribed in a drought contingency plan to be prepared for the project. (See page 189 of the DEIR for a detailed description of the plan.) In addition, approximately 8 percent of the irrigation water would be provided by reclaimed effluent from the package wastewater treatment plant. (As discussed at pages 196-7 of the DEIR, the treated effluent would be applied at rates no greater than evapotranspiration rates, so there would be no surface runoff or seepage below the root zone.)

5. **What is the procedure for determining detailed on-site hydrogeologic conditions, for establishing the location of production wells, and for establishing a groundwater monitoring program.**

Response

Initially, a 24-hour aquifer test would be performed on one of the existing wells on the property. Static water levels would be measured in the pumping well as well as a monitoring network of at least one on-site well and one off-site well (i.e., existing well(s) on neighboring properties). Drawdown and recovery levels would be recorded in all wells during the pumping test. Based on the results of the aquifer test, calculations of transmissivity, specific capacity, and storitivity would be prepared. This information would enable the geohydrologist to make a determination as to the maximum radius of pumping influence (see diagram on page 4). Once this has been established, a setback line can be drawn so that new on-site production wells would not have an impact upon existing off-site wells. Once the setback line has been established, an on-site survey for the purpose of locating one or more on-site production wells would be performed. Based on the results of this survey, one or more production wells would be constructed, and the water-bearing characteristics of the formations evaluated.

A 72-hour pumping test to determine well production parameters such as specific capacity and recommended pumping rates would be performed following construction of the wells. At the conclusion of the test, a water sample would be collected for an evaluation of constituents in accordance with State and County drinking water standards.

A monitoring well network would be developed including the production well(s), other on-site wells and appropriate off-site wells (i.e., existing wells on neighboring properties). In order to develop a water level history, measurements would be taken in each of the wells for an extended period of time. Individual well hydrographs would be developed. In addition, a precipitation gauge would be installed at the site in order to develop accurate rainfall totals. This information will allow periodic updates of the aquifer characteristics, and assure that an overdraft condition would not occur.

B. AGRICULTURE

General Overview of Issue

The project would involve the conversion of 110 acres of prime farmland to residential use. The agricultural economic study prepared for the DEIR concluded that an agricultural operation on the project site would not be economically viable under current conditions. Concerns have been raised as to whether this conclusion is valid, and whether a different conclusion may have been reached if more profitable crops, such as grapes, had been analyzed.

Background

The study of agricultural economics by Dr. James A. Niles analyzed the economic feasibility of three types of agriculture production - walnuts, row crops, and cattle - on the portions of the site where those activities had traditionally occurred. The study included an analysis of two scenarios for each crop type. The first scenario reflected existing site conditions such as current land rents and property tax rates. The second scenario assumed a family farm operation with no land costs and reduced property taxes under the Williamson Act. Even under the more favorable conditions of the second scenario, the operations were found to cover costs at best, with no return on investment. The study compared the site to an existing walnut operation in the San Joaquin Valley, which is economically successful.

Major Comments and Responses

1. **The conclusion that agricultural operations in South Santa Clara are not economically viable is incorrect. There is not a sufficient difference between Santa Clara County and San Joaquin County whereby the same activity would be economically viable there but not here.**

<u>Response</u>

The agricultural feasibility report prepared by Dr. Niles was unclear with respect to a key element of the analysis. That is, although the family farm scenarios assumed no land costs and reduced property taxes under the Williamson Act, the cost of starting up a new farming operation was factored into the cost analysis (this latter information was not clearly explained). These start-up costs, which include land preparation, the cost of walnut trees, and the cost of planting, were factored in to make these scenarios somewhat realistic. In the San Joaquin Valley example, there are no such start-up costs to be paid off, and therefore it is economically viable while the project case would not be. By the same token, Dr. Niles study was not meant to imply that existing agricultural operations in Santa Clara County are not economically viable, particularly since most of these operations are probably not carrying debt for start-up costs.

2. **Since the project includes the planting of vineyards as mitigation for the conversion of prime farmland, the economic study should include an analysis of vineyards as well. Because of the high prices available for grapes, such an analysis should show vineyards to be an economically viable operation here.**

<u>Response</u>

In response to this comment, Dr. Niles undertook an analysis of a hypothetical vineyard on the Hayes Valley site. This additional analysis has been added to Appendix B of the EIR. (See *Section VI. REVISIONS TO THE APPENDICES OF THE EIR.*) The analysis considered a hypothetical 400 acres of vineyards on the site. Based on current yields and prices, the analysis concluded that it would take at least 10 years before such an operation would reach a break-even position. This is due to the extremely high start-up costs for vineyards, which would total almost $6 million (not including land costs) before the first harvest in the third year of operation. While a vineyard would ultimately be profitable, the conclusion reached was that such an operation would not be financially justified given the opportunity cost of capital and the risk of the operation.

C. LAND USE

General Overview of the Issue

There is a concern that this development is too intense and therefore is not compatible with the rural character of San Martin.

Background

The project consists of a number of elements including 41 residences, a golf course with a clubhouse, and 45 units of overnight accommodation, along with auxiliary uses such as an equestrian center and a swim and tennis center. All of these uses are permitted by the Hillsdale (HS) zoning ordinance which applies to the site.

Major Comments and Responses

1. **This project is urban in scale and intensity and thus is not compatible with this rural area.**

Response

The project includes a large acreage, but it also demonstrates how the hillside cluster ordinance operates to concentrate permissible development in a confined area while preserving the vast majority of the site as permanent open space. The slope density formula in the Cluster Ordinance determined that minimum residential densities on the site to be one lot per 36 acres, resulting in 35 Hillside cluster lots (the remaining 6 lots are in an existing Rural Residential area not subject to the slope-density formula). This is a very low density relative to other residential areas of San Martin.

In terms of overall intensity of the development, the total coverage of buildings is 1.5 percent over the 410-acre development area (including the 263-acre golf course area), and 0.4 percent of the total site area. The total coverage by all impervious surfaces, including all structures, roads, cart paths, driveways, and parking areas, is 6 percent over the 410-acre development area and 1.5 percent of the total site area. Compared with 40 to 50 percent for a typical suburban subdivision, and 80 to 95 percent for industrial park or commercial retail development, the proposed coverages do not represent a large scale or intensive development.

2. **This project would set a precedent for large scale intensive development in the County.**

Response

As discussed in Section II of the DEIR, the proposed project conforms with the "Hillsides" designation of the County General Plan, and the provisions of the Hillside (HS) Zoning District. Section 14-4.2(b) of the HS zoning regulations specifically permit all of the uses proposed including clubhouse, overnight accommodations, swimming pools, tennis courts, and bar and restaurant. Also permitted under HS zoning regulations are corrals and caretakers residences. Thus the proposed project is not an inappropriate use for the site according to the applicable County General Plan and zoning requirements.

Although a specific project including a golf course and residential subdivision may not have been previously proposed in the County, it has been a permitted combination of uses in HS zone for many years. Therefore, it would not be precedent-setting in the sense that it would represent a combination of land uses not previously permitted in the County. It just happens to be the case that no project has been previously brought forward which seeks to fully utilize the provisions of the applicable General Plan and zoning.

3. **The proposed overnight accommodations are an inappropriately intense and commercial use.**

Response

Section 14-4.2(b) of the County's Hillside zoning regulations specifically permit overnight accommodations within the HS zone. There is a pending County study to determine the appropriate size of ancillary facilities, including overnight accommodations, that should be constructed in conjunction with golf course development. On April 18, 1995, the Board of Supervisors approved the recommendation of the Planning Commission that pending golf course use permit applications (specifically the Lion's Gate and Los Gatos County Club projects) not be required to wait for completion of study of "Hillsides" zoning ordinance, as recommended in General Plan implementation recommendation R-LU(i) 9. This implementation was to specify maximum permissible sizes of facilities allowed in conjunction with golf courses, including clubhouses, overnight accommodations, and restaurants. The Planning Commission findings in support of the recommendation stated that the golf course proposals did not involve facilities that appeared to be out of scale relative to the size of the golf courses. It is important to note that, at that time, the proposed Lion's Gate project included 60 units of overnight accommodation, which has since been scaled back to 45 units.

The finding required in the HS section of the zoning ordinance to determine the appropriateness of the overnight accommodations is that they be "consistent with both the scale of the golf course development and the rural character of the zoning district." The proposed overnight accommodations would be constructed as a series of adobe cottages following the natural contours. Having a low profile with much variation in building planes and rooflines, these units would not appear as a massive hotel but would blend in with the surroundings. The total floor area of the overnight complex would be approximately the same as the clubhouse and thus would be consistent with the scale and the character of the clubhouse, which also would be built in adobe style.

At 34,000 square feet, the overnight complex would represent 0.3 percent of the total golf course area, 0.2 percent of the total development area, and 0.05 percent of the total site area. Thus it would not represent an intensive use of the site.

D. GROWTH INDUCEMENT

General Overview of the Issue

There is a concern that the golf course could be redeveloped in the future for a residential subdivision, and that the proposed package wastewater treatment plant would be expanded to accommodate future growth in San Martin.

Major Comments and Responses

1. **The golf course could be redeveloped for residential use in the future.**

<u>Response</u>

There is a very low probability that the golf course would be redeveloped for another use. Considering the effort and expense of gaining project approval for the golf course, and the huge investment required to construct a premiere facility, it makes no sense to turn around and try to develop the site for something else. Under the HS zoning, the golf course area could be developed for 13 cluster lots at most, which does not provide a financial incentive for converting the golf course. Any proposal for a more intensive development would require a General Plan amendment to Rural Residential, but the General Plan specifically prohibits the creation of new Rural Residential areas or the expansion of existing Rural Residential areas.

2. **The package wastewater treatment plant could be expanded to accommodate future growth in San Martin.**

It would be difficult to expand the treatment system once it is installed. All of the components of the package wastewater treatment facility would be sized to serve only the Lion's Gate project. That is, the treatment capacity would be limited to 30,000 gallons per day, which represents the peak daily flows from the project as proposed. It would be very difficult, if not impossible to add to the system at a later date to accommodate additional development. The proposed treatment plant site is in a constrained location with no area available for expansion. Additionally, it would not be possible to expand the effluent disposal pond given its location on top of a knoll, and there are no suitable locations for additional ponds nearby. Also, new pipeline would have to be laid and pump stations added. It is unclear what the incentive would be to the homeowners association and the country club for tolerating the inconvenience and nuisance of a system expansion that would not benefit them.

Even if a treatment plant expansion were to be proposed, the operating permits from the County Department of Environmental Health and the Regional Board would require modification, and the required expansion of the Community Services District would require the approval of LAFCO.

III. COMMENT LETTERS AND RESPONSES

This section contains copies of the written comments received on the DEIR, as well as the responses to those comments. The individual comment items are numbered in the margins of the comment letters, with the corresponding responses appearing on the facing page.

To facilitate cross-referencing, each response has an alpha-numeric identification corresponding to the comment and the item number. Thus Response A.4 is the response to item "4" in comment letter "A."

Public comment is important for two reasons. First, comments add information to the public record which is used in the decision-making process. Comments require written responses which clarify EIR statements or expand discussion. Comments may also present new useful information for consideration. Second, public comment provides a gauge of public opinion and lets decision makers know the community reaction to a proposed project.

Responses were prepared only for comments which refer to a specific substantive item or aspect of the DEIR. Comments such as "I am opposed to the Lion's Gate project," state opinion and feeling about the project and are helpful for decision-makers to decide the fate of the project. Unfortunately, comments of this nature do not provide specific comment on the EIR or environmental issues, and thus are difficult to respond to. However, opinion comments are published in the EIR for the record.

A

STATE OF CALIFORNIA - THE RESOURCES AGENCY PETE WILSON, Governor

DEPARTMENT OF FISH AND GAME
POST OFFICE BOX 47
YOUNTVILLE, CALIFORNIA 94599
(707) 944-5600

May 6, 1996

Ms. Jaunell Waldo
County of Santa Clara
70 West Hedding Street
San Jose, California 95126

Dear Ms. Waldo:

SCH 94043016 - Draft Environmental Impact Report (DEIR)
Lion's Gate Reserve

Department of Fish and Game personnel have reviewed the Draft EIR for the proposed Lion's Gate Reserve project. The 1,676-acre project site is located west of San Martin in southern Santa Clara County and has been used for agriculture and cattle grazing. The West Branch of Llagas Creek runs through the property. The project consists of an 18-hole golf course with ancillary facilities, 41 custom home lots, and an equestrian center. An area of 1,265 acres would be set aside as private open space.

We believe that the document in its present form does not adequately address impacts to biological resources, and does not provide adequate measures to avoid significant impacts and mitigate unavoidable impacts. The reasons for this assessment are as follows.

1. Impacts to wetlands on the site could be reduced by
modification of the project design without affecting the
1 feasibility of the project. For instance, the maintenance
access road to Watsonville Road should be realigned to avoid
the existing seasonal wetlands. Based on the floristic
analysis, these wetlands appear to qualify as vernal pools, a
scarce community type which needs to be protected.

2 2. It appears that the golf course design will have unnecessary
impacts on riparian habitat. Use of a "links" design would
reduce the need for pesticide and fertilizer use and minimize
the extent of grading. Holes which span the main creek or
tributaries should be redesigned to eliminate the span in
order to reduce the potential for loss of habitat and human
intrusion. The proposed prohibition on golfers entering the
riparian zone to retrieve lost balls is unenforceable and does
not address the problem.

A. Response to Department of Fish and Game

NOTE

Since the time that this comment letter was received, DFG biologist Jeannine DeWald met with the biological consultant at the site on June 24 to review the concerns expressed in that letter. As a result of the clarifications provided in that meeting, and the recently completed refinements to the project and biological mitigations, as discussed in the responses below, the DFG representative indicated general satisfaction with these clarifications and mitigations. A confirmation letter regarding the above is currently being prepared by DFG.

1. Comment acknowledged. It has been the applicant's intent to route the maintenance access road around the seasonal wetlands, although this is not reflected in the site plan or in the biological analyses contained in the DEIR. Accordingly, the site plan and biological discussion have been revised to reflect the intended avoidance of these seasonal wetlands. (See Section *V. TEXT AMENDMENTS*.)

2. The golf course plan includes 97 acres of irrigated fairways and roughs, and does not include maintained turf areas between fairways. The practice of irrigating between fairways is common in older courses typically results in over 120 acres of irrigated turf. With respect to pesticide and fertilizer use, chemical applications would be carefully programmed and minimized in the proposed integrated pest management plan, which emphasizes cultural practices and other techniques to minimize pesticide use. Those measures include: selecting species that are pest resistant and have low nitrogen requirements; minimizing fertilization in the winter when growth rates are low; application of pesticides, fungicides and herbicides sparingly and only in response to an identified problem, rather than on a preventative basis; application of irrigation water to match plant needs so little or no water seeps below the root zone; and other non-chemical measures to maintain healthy turfgrass.

   The proposed golf course plan shows two holes which would cross the main creek channel. Both of these holes include several tee boxes, including tees on the opposite side of the creek. This provides golfers with the option of not playing over the creek channel. Signs would be posted prohibiting golfers from retrieving their balls from the riparian area. The tendency for unauthorized incursions would be further reduced by not assessing a penalty stroke for balls hit into the riparian zone and left there. As discussed in the biological resources section of the DEIR, the on-site riparian areas are severely degraded and have minimal habitat value. The plant species found along the creek channel are those commonly associated with the adjacent non-native annual grassland. The project includes a riparian restoration and enhancement plan, which together with the removal of cattle grazing would result in the establishment of viable riparian habitat. However, no tree or shrub planting is proposed at the points where the two holes play across the creek channel. The occasional unauthorized incursion by golfers into these limited crossing areas would not result in significant impacts to the creek-side habitat. In addition, information would be distributed to golfers regarding the course's membership in the Audubon Sanctuary Program, and the value of the riparian corridor and the importance of not entering it.

3 3. Mitigation ratios for loss of riparian habitat are not acceptable. We commonly require replacement of habitat acreage (rather than trees) at a ratio of 3:1. This is a long-established standard for riparian replacement. The argument for a reduced riparian setback is also unconvincing. One of the functions of the setback is to protect species which are sensitive to human disturbance from contact which could disrupt normal behavior patterns. In an area which is not densely vegetated, distance is crucial to the performance of this function. We believe that the standard 100-foot setback should be required as a minimum.

4 4. The mitigations incorporated in the project for California tiger salamander are not adequate. The DEIR proposes erection of a fence to force estivating salamanders to move out of the construction area, but does not consider whether sufficient suitable habitat will be available or whether the relocation itself could result in mortality. The proposed introduction of salamander larvae to two currently existing but unused stock ponds is also a questionable undertaking unless it can be demonstrated that the ponds are in fact suitable habitat. Unoccupied habitat is generally unoccupied for a reason.

5 5. The preservation of Pond 1 for pond turtles is valuable, but may not be adequate. Unless sufficient nesting and estivating habitat is available, the population will eventually die out.

6 6. The Morgan Hill area is an important component of burrowing owl habitat in the South Bay area. Burrowing owls in this area form a subpopulation which exchanges immigrants with San Jose owl populations, helping to preserve the long-term viability of the regional owl population. Preservation of owl habitat on the project site is therefore important. With the removal of grazing, grasslands on the site are likely to become overgrown and cause loss of habitat value for owls. Ground squirrel control on the site would also adversely affect burrowing owls, as well as badgers and California tiger salamander. We strongly recommend that a habitat management plan be developed and implemented to provide long-term habitat maintenance for these species. This would include (but not be limited to) maintenance of vegetation in a suitable condition through mowing or grazing, maintenance of ground squirrels on the site, and aggressive control of bullfrogs throughout the project site.

7 7. The actual level of protection given to serpentine habitat is somewhat nebulous. We recommend that the area be demarcated by a permanent fence to prevent accidental intrusion, and that

3. H.T. Harvey recently completed a reassessment of potential project impacts to the riparian habitat of the Lion's Gate site. The initial assessment of riparian impacts by H.T. Harvey was based on the analysis of an aerial photograph and an earlier version of the project site plan. The site plan has since been modified to avoid some direct impacts and to reduce the dewatering effects by maintaining creek flows in tributaries that were previously shown as being filled. In addition, the accuracy of the impact assessment was improved with more precise measurements of canopies in the field that was not possible using the aerial photographs. Also, one group of trees which appeared to be under riparian influence on the aerial photograph was found to be in upland habitat when examined in the field. As a result of the above plan refinements and more accurate measurements, the impact to riparian vegetation is 0.50 acres of vegetation removal and 0.33 acres of vegetation that becomes non-riparian as a result of channel dewatering, for a total of 0.83 acres of impacts. Since the riparian restoration and enhancement plan includes 2.5 acres of replacement planting, this would satisfy the 3:1 replacement ratio. The EIR has been revised to include this updated information. (See Section *V. TEXT AMENDMENTS*.)

With respect to riparian setback, the suggested 100-foot setback may be appropriate where there is a well-developed riparian corridor which provides high habitat value. However, the value of the habitat is largely dependent on the floristic and structural diversity of the riparian zone. The riparian habitat on-site consists mainly of a few isolated valley oaks and sycamores that lack an understory. The wildlife value of these riparian woodlands is substantially less than the less disturbed riparian woodlands in the region (i.e., portions of Llagas Creek, Little Arthur Creek, etc.). The on-site riparian areas are used much less frequently and by fewer species of wildlife than those other less disturbed riparian habitats. Therefore, the reduced setbacks proposed in the DEIR would adequately off-set impacts to these degraded riparian habitats. It should also be noted that no buildings are proposed within 100 feet of the channel, and parking lots would be set back at least 75 feet. Thus only turfed areas would be located less than 75 feet from the creek channel. As noted in the DEIR, turfed areas along the riparian corridor are used by wildlife and do not inhibit wildlife movement along the creek.

4 The project proposes several measures to mitigate impacts to the California tiger salamander. This includes preservation of existing breeding habitat (ponds 1, 3, 6 and 7), preservation of two existing ponds which provide potential breeding habitat (ponds 4 and 5), construction of two new ponds to mitigate for the loss of pond 2, and the preservation of upland retreat habitat at a greater than 1:1 ratio. The introduction of salamander larvae to ponds 4 and 5 from pond 2 (the pond to be filled) is only one component of the overall CTS mitigation plan. The fact that CTS larvae were not found in these ponds during a reconnaissance level survey (1 visit) using a dip net does not mean they are not present. LSA's experience with long-term monitoring of known breeding ponds in the Livermore Valley of Alameda County indicates CTS do not successfully reproduce every year in a given pond. They have also found that dip netting the margins of a pond can result in no captures while use of a seine or drop net results in captures. Ponds 4 and 5 appear to be physically suitable breeding ponds.

5. The project proposes more mitigation than is referenced in this comment. Pond 1 would be preserved and upland habitat suitable for nesting would also be preserved in its vicinity. A second pond suitable for use by pond turtles would be constructed in project open space. This pond would be constructed upstream of the existing pond resulting in a direct hydrological link and providing a secure movement corridor between the two ponds.

the project proponent be responsible for preventing the intrusion of grading activity connected with future home construction on Lots 7 and 8.

8

8. The potential occurrence of the longhorn fairy shrimp and vernal pool fairy shrimp on the project site needs to be addressed further. The DEIR concludes that neither species is present based on "preliminary" or "reconnaissance-level" surveys and known species distribution. Known distribution is not a reliable indicator when the species is as poorly known as these fairy shrimp. We recommend either more complete documentation of why the habitat is not suitable, or focused surveys. The Federal status of these species and the proposed destruction of the vernal pools make this determination extremely important. Failure to adequately determine occurrence of these species could result in a violation of Federal law if take occurs.

Based on the information provided in the DEIR, we believe that approval of the project in its present form would result in significant adverse impacts. We recommend that consideration of the DEIR be deferred until the issues raised have been addressed, and a revised DEIR has been prepared and circulated for public and agency review.

Thank you for the opportunity to review and comment on this project. If you have any questions or would like to arrange a meeting, please contact Jeannine M. DeWald, Associate Wildlife Biologist, at (408) 429-9252; or Carl Wilcox, Environmental Services Supervisor, at (707) 944-5525.

Sincerely,

Brian Hunter

Brian Hunter
Regional Manager
Region 3

cc: U. S. Fish and Wildlife Service
Sacramento

Corps of Engineers

6. One Burrowing Owl was detected on-site in 1988. Numerous surveys have been conducted since that time and no other Burrowing Owls have been detected on-site. Therefore, while portions of the site (primarily the grasslands of the valley) support suitable habitat, owls have not bred or wintered on-site since at least 1988. Nonetheless, the DEIR recognizes the possibility that Burrowing Owls may use the site in the future and thus calls for pre-construction surveys to ensure that breeding owls (or their eggs or young) are not adversely effected by project construction. Although grazing would be discontinued on the site, the extensive remaining grasslands on the site would be mowed regularly to reduce fire hazard.

   Although the site does not currently have a large ground squirrel population, efforts to control them would only take place within the golf course area itself.

   As noted in the "California Tiger Salamander and Western Pond Turtle Mitigation Plan" contained in Appendix F of the DEIR, the monitoring program includes measures for searching and removal of bullfrogs and their tadpoles.

7. As noted under Mitigation 8 on page 133 of the DEIR, the serpentine area would be fenced both during construction and after construction to prevent incursion. As a practical matter, it is unlikely that grading activity would approach the serpentine boundary which occurs in the steeply sloping areas at the rear of two substantial sized lots (minimum 2 acres). After construction is complete, a permanent fence would be erected along the serpentine boundary, and signs would be posted as part of a public education program designed to sensitize the residents about the habitat value of this area.

8. According to H.T. Harvey and Associates and LSA Associates, the project site is unlikely to support the listed species of fairy shrimp for the following reasons: 1) none of the listed species have been observed within Santa Clara County; 2) the pools on the property are fairly degraded; and 3) natural conditions on the site would not have included conditions favorable to supporting native populations on the site. None of the listed vernal pool invertebrates are known to occur within the Santa Clara County. The nearest observations were the vernal pool tadpole shrimp *(Lepidurus packardi)* in southern Alameda County (at Warm Springs Seasonal Wetland near Fremont, Caires et al. 1993), and the vernal pool fairy shrimp *(Branchinecta tynchi)* in Pinnacles National Monument in southern San Benito County (C. Nagano, USFWS, pers. comm.) and Fort Hunter Liggett in southern Monterey County (CNDDB). The longhorn fairy shrimp (*Branchinecta longiantenna*) has one of the most restricted ranges of the listed fairy shrimp. The longhorn fairy shrimp is known from only four populations: Kellog Creek Watershed, Altamont Pass, Carrizo Plain, and Kesterson Reservoir. The California linderiella *(Linderiella occidentalis)* occurs in Santa Clara County. However, this species was not listed because it was found to be have a broad distribution and was relatively common within its range (USWFS 1994). These distributions are based on the best scientific and commercial evidence (as outlined in the Federal Endangered Species Act) during the listing process and during extensive surveys that have been conducted statewide since the listing of these species has occurred.

   Pools on the Hayes Valley property are fairly degraded with a dirt access road passing through several of the pools. These areas appear to be man-made and seem to have resulted from channelizing of Hayes Creek, mounding of the fenceline and grading of the access road.

   None of the seasonal weltands on the site are conducive to supporting populations of the listed fairy shrimp. The stock ponds on the site are not considered fairy shrimp habitat because they hold water for too long a period for conditions to be right for fairy shrimp. The seasonal

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County of Santa Clara

Environmental Resources Agency
Planning Office

County Government Center, East Wing, 7th Floor
70 West Hedding Street
San Jose, California 95110-1705
(408) 299-2454 FAX 279-8537

HUGH GRAHAM
SENIOR PLANNER
*********PONY*********

June 24, 1996

**Subject: Final Environmental Impact Report
for Lion's Gate (Hayes Valley) Golf Course and Housing
SCH# 94043016**

Enclosed is the Final Environmental Impact Report (FEIR) prepared for the Lion's Gate project. This document responds to comments on the Draft EIR circulated in March and April of 1996.

A public hearing, at which the Planning Commission will make their recommendations on certification of the EIR and on the two proposed General Plan amendments and associated rezonings will take place on **July 11, 1996** beginning at 10:30 a.m.. The meeting will take place in the Board of Supervisors chambers in the County Government Center at 70 West Hedding Street. A public hearing, at which the Board of Supervisors will make a final determination regarding certification of the EIR and on the General Plan amendments and associated rezonings and will be held on **July 23, 1996**. An exact time has not yet been established for the hearing, although it is likely to begin at 1:30 p.m.. Interested parties may call the Clerk of the Board's office at 299-4321 a few days prior to the hearing to determine when the hearing will take place.

Several other actions will be required prior to approval of this project. To receive notification of those hearings, contact Jaunell Waldo at (408) 299-2521, extension 233.

wetlands in the vicinity of Watsonville Road were created by the interruption of natural drainage in that area. These areas did not historically pond water although there may have been some surface saturation. Therefore, it is unlikely that the listed fairy shrimp would have been native to the site. Since there are no nearby populations of listed fairy shrimp, there is no way that the artificially created seasonal wetlands would have become colonized.

B

STATE OF CALIFORNIA

PETE WILSON, Governor

NATIVE AMERICAN HERITAGE COMMISSION
915 CAPITOL MALL, ROOM 364
SACRAMENTO, CA 95814
(916) 653-4082

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April 9, 1996

Jaunell Waldo
Santa Clara County Office of Advance Planning
County Government Center, East Wing
70 W. Hedding Street
San Jose, CA 95110

RE: Draft EIR Lion's Gate Reserve (Hayes Valley) Golf Course

Dear Ms. Waldo:

On reading the above referenced Draft EIR, I notice that on page 141 Mitigation 2(b), it states that if *any human remains are discovered they shall be removed, the remains shall be analyzed, a report shall be prepared, and if determined to be Native American, the remains shall be reburied under the direction of a designated Native American group.* To be clearly understood this mitigation statement needs clarification.

1 Section 7050.5 (b) of the Health and Safety Code and Section 5097.98 (a)(b) of the Public Resources Code clearly states the steps that are to be taken if human remains are found. The statement in the EIR is not clear regarding the removal of remains immediately upon discovery. Secondly, the narrative states that the remains shall be analyzed. This needs clarification, as to what type of analysis is intended. Finally, remains are reburied under the direction of a Most Likely Descendant(s) (Public Resources Code 5097.98)(a)(b).

Please feel free to call me if you have any questions.

Sincerely,

Gail McNulty

Gail McNulty
Associate Program

B. Response to Native American Heritage Commission

1. Comment noted. The referenced mitigation measure has been revised to more closely correspond to the language in the cited legislation. (See Section V. *TEXT AMENDMENTS*.)

State of California PETE WILSON, Governor

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD --
CENTRAL COAST REGION
81 Higuera Street, Suite 200
San Luis Obispo, CA 93401-5414
(805) 549-3147

May 2, 1996

Ms. Jaunell Waldo
Santa Clara County Office of Advance Planning
County Government Center, East Wing
70 W. Hedding Street
San Jose, CA 95110

Dear Ms. Waldo:

Thank you for the opportunity to comment on the Draft Environmental Impact Report (DEIR) for the Lion's Gate Reserve (Hayes Valley) Golf Course project. Overall, the project appears environmentally conscientious. Based on our policies and experience, we offer the following comments:

<u>Project Description, Page 24: Equestrian Center</u>
1 The DEIR states that any proposal to compost manure would require approval from the Department of Environmental Health Solid Waste Unit. The Regional Board also regulates composting operations.

<u>Project Description, Page 24: Maintenance Facility</u>
2 The maintenance facility includes an "advanced wash water filtering and recycling system". That system will produce sludge and wastewater. The sludge and wastewater will contain detergents, oils, and other contaminants. The DEIR does not state how the waste products will be handled.

<u>Project Description, Page 27: Drainage</u>
3 The DEIR states that there are several instances where short reaches of tributary drainage would be rerouted or piped to accommodate fairway layout. Any loss of overall infiltrative capacity should be mitigated.

<u>Project Description, Page 27: Residential Drainage</u>
4 The DEIR states that the drainage from the rural residential subdivision located north of Highland Avenue would be conveyed directly to the reach of West Branch Llagas Creek. A direct conveyance indicates that no treatment for urban runoff, or siltation will occur. All stormwater impacts resulting from the project should be mitigated.

5 <u>Project Description, Page 31: Fertilization</u>

The DEIR states that soils will be tested regularly for potential nitrogen buildup. That language seems vague and does not provide assurance that sampling and testing will occur with an appropriate frequency.

<u>Project Description, Page 31: Pest Management</u>
6 The DEIR states that an area will be provided for mixing and loading of pesticides. The DEIR should describe the fate of spilled pesticides and washdown water from the pad.

C. Response to Regional Water Quality Control Board - Central Coast Region.

1. Comment noted. The EIR has been revised to include this additional information. (See Section *V. TEXT AMENDMENTS)*

2. The treated water from the system would be recirculated for reuse in equipment washing. The accumulated sludge and other wastewater constituents would be dewatered and dried to a solid state and disposed of at a landfill.

3. The minor loss of infiltration capacity would be more than compensated for by the stormwater retention basins to be created.

4. The DEIR incorrectly stated that drainage from this area would be conveyed to the creek. The project engineer, Forsgren Associates, indicates that the drainage from this area would be conveyed to a small retention basin to be constructed in the northwestern portion of this area. The EIR has been revised to include this corrected information. (See Section *V. TEXT AMENDMENTS.)*

5. The sampling frequency for nitrogen recommended by Audubon Conservation Services is quarterly sampling during the first three years of operation, and semi-annually after that. The EIR has been revised to include this new information. (See Section *V. TEXT AMENDMENTS.)*

6. The washwater and hazardous materials treatment and recycling system is described on page 25 of the DEIR under "Maintenance Facility." This description has been expanded to discuss the fate of materials collected by the treatment equipment. (See Section *V. TEXT AMENDMENTS.)*

Project Description, Page 34

7 Our authority also includes protecting surface and ground water quality from nonpoint sources.

Section III.F. Water Quality, Page 97, Impact 2

8 The narrative states that several tributary swales would be piped within proposed fairways. Piping of the swales eliminates the environmental benefits of the swale. It is not clear whether or not these piped swales were included in the calculations for loss of riparian areas.

Section III.F. Water Quality, Page 97, Mitigation 3

Sheet flows over the clubhouse and practice range parking lots will contain common urban runoff contaminants. The narrative states that the stormwater would percolate into the soil or evaporate. One would expect the same fate for the contaminants. Undoubtedly some biodegradation would occur with respect to organic contaminants. However some organic and inorganic contaminants could migrate to ground water or accumulate in the basins.

9

The narrative states that the basins would be cleaned of accumulated debris as needed. It seems that the basins would only be cleaned if massive siltation or large debris were observed visually. Such occurrences are not likely and the basins are not likely to be cleaned for many years. During that time it is conceivable that an accumulation of urban runoff contaminants could result in an unwanted situation. Installation of floatables/settleables traps at the parking lot collection points could separate out some contaminants before the runoff enters the retention basins, thereby reducing the amount of contaminants entering the retention basin. Such traps would necessitate periodic inspection and cleaning.

10 Section III.F. Water Quality, Page 99, Mitigation 4

The narrative discusses the use of a computerized irrigation control system. As stated in the Project Description, there are many variables that affect the effectiveness of the computerized system and that fine-tuning of the irrigation program would be essential. The discussion of the computerized irrigation system does not instill confidence that the system will meet the expectations described in the DEIR. Aside from the DEIR's claim that little or no water will seep below the root zone, there should be some assurance that the system will operate as intended.

Section III.F. Water Quality, Page 101, Mitigation 4, Monitoring

11 The DEIR states that four new wells will be installed for sampling and testing ground water. Although a ground water monitoring well may be identified as a "background" or "downgradient" well prior to its installation, it is not assured that the well will actually represent background or downgradient water quality. The direction of ground water movement does not always correlate to surface topography nor does it ensure that you are even sampling the same ground water. Therefore the determination of whether or not the wells are appropriately sited can only be made after an adequate evaluation of sufficient hydrogeologic information. The four wells depicted in the DEIR may or may not be appropriate to accomplish the intended goal.

Section III.F. Water Quality, Page 104, Mitigation 6

12 The DEIR discusses manure management, but failed to address equine urine management. Although manure will be picked up and vacuumed up, urine will not. The environmental impacts of equine urine were not discussed.

7. The Regional Board's authority for non-point source control is encompassed by the reference to the NPDES program, as noted on page 34 of the DEIR.

8. The swales to be removed were included in the calculation for loss of riparian areas, to the extent that they include riparian vegetation. All swales to be removed were included for loss of wetlands if they met the Corps' criteria for jurisdictional wetlands under Section 404 of the federal Clean Water Act.

9. Comment noted. The EIR has been revised to note that suggested floatables/settleables traps would be installed in the drainage systems for the parking lots. (See Section *V. TEXT AMENDMENTS.)*

10. The computerized irrigation system would be managed by the golf course superintendent who would be certified in system operation and would have been employed prior to construction of the golf course. As such, the superintendent would gain a detailed understanding of the various soil types and microclimates throughout the golf course as well as the characteristics and requirements of the turf grass varieties used on the tees, greens and fairways. Irrigation water applications would be adjusted for individual areas or zones of the golf course depending on localized conditions and needs. The amount of applied water can even be controlled for each individual sprinkler if necessary. The irrigation system would be linked to an on-site weather station which would provide constant monitoring of weather conditions and would facilitate calculation of evapotranspiration (ET) rates throughout the course. Combined with coefficients for specific turfgrasses provided in the Environmental Management Plan, this data would allow determinations of precise watering requirements for the different parts of the course. The golf course superintendent and irrigation technician would be required to undergo extensive training in the operation of this computerized system prior to the start of golf operations. It is also important to note that there is a strong incentive not to overwater, since it represents and unnecessary expense, and because overwatering creates conditions where fungus can become established.

11. As discussed in the preliminary groundwater investigation by Geoconsultants, Inc., contained in Appendix M of the DEIR, the Hayes Valley aquifer flows from west to east through the project site. Since Hayes Valley contains the headwaters of West Branch Llagas Creek and is confined on the north and south by uninterrupted ridges, there is no doubt that groundwater follows the natural contours downslope to the east.

    Although studies of transmissivity have not yet been conducted, a review of on-site soil types indicates that groundwater on the site would flow in a predictable pattern.

    The well locations shown in Appendix C are based on the best information currently available. The locations of the wells would be fine-tuned during the ASA process once more detailed hydrogeologic information becomes available.

12. The main issue with equine urine is the ammonia and bacteria that are absorbed into the soil where the horses are pastured. During the dry period, a large portion of the ammonia is volatilized. During the wet period, when volatilization is low, there is a greater potential for conversion to nitrogen with some leaching into the soil. However, even under these conditions, equine urine does not represent a significant nitrogen loading factor.

Section III.G. Biological Resources, Page 127, (d)

13 The Regional Board must certify that any permit issued by the U.S. Army Corps of Engineers pursuant to Section 404 of the Clean Water Act (covering dredging or filling of wetlands) complies with state water quality standards, or waive such certification. Section 401 Water Quality Certification is necessary for all 404 Nationwide permits, reporting, and non-reporting, as well as individual permits.

Section III.G. Biological Resources, Page 127, (e)

14 The narrative states that since the quality of the riparian habitat on-site has been degraded due to many years of livestock grazing, smaller buffers would adequately protect existing riparian functions and values. The goals of the California Wetlands Conservation Policy include ensuring "no overall net loss and achieving a long-term net gain in the quantity, quality, and permanence of wetlands acreage and values". It is our experience that riparian areas can quickly rebound from historic, excessive grazing. Although a smaller buffer may protect existing riparian functions and values of the degraded areas, the project offers a prime opportunity to partially mitigate grazing damage and increase wetlands acreage. By maintaining a setback equal to that for the riparian woodland, it is probable that the degraded wetland areas will rebound.

If you have any questions, please call **Tom Kukol at (805) 549-3689** or Brad Hagemann at (805) 549-3697.

Sincerely,

Bradley E Hagemann

For Roger W. Briggs
Executive Officer

TJK\LionDEIR\SJM\p:\cm
Task: 121-01
File: Lion's Gate

13. Comment noted. The DEIR has been revised to include this additional information. (See Section *V. TEXT AMENDMENTS.)*

14. As discussed on page 125 of the DEIR, the project includes a Riparian Habitat Restoration and Enhancement Plan which provides for the re-establishment of riparian vegetation along the on-site reach of West Branch Llagas Creek. In addition, new wetlands would be created by expanding the existing pond and through the creation of three new ponds for tiger salamander and pond turtle habitat.

D

STATE OF CALIFORNIA — ENVIRONMENTAL PROTECTION AGENCY

PETE WILSON, Governor

DEPARTMENT OF TOXIC SUBSTANCES CONTROL
REGION 2
700 HEINZ AVE., SUITE 200
BERKELEY, CA 94710-2737

(510) 540-2122

RECEIVED
PLANNING OFFICE

96 APR 22 PM 4:21

April 19, 1996

Ms. Juanell Waldo
Santa Clara County
East Wing, 7th Floor
70 West Hedding Street
San Jose, California 94545

Dear Ms. Waldo:

DRAFT ENVIRONMENTAL IMPACT REPORT FOR THE LION'S GATE PROJECT STATE CLEARINGHOUSE NUMBER 94043016

The State Clearinghouse provided the Department of Toxic Substances Control (DTSC) with a copy of the Draft Environmental Impact Report for the above project. DTSC has reviewed the report and with this letter transmits its comments.

1 The soils at the site are likely to contain pesticides resulting from past agricultural operations. No soil samples have been taken and analyzed for contaminants. If these substances are present in the site soils, there would be potential for human exposure to these substances during construction of the proposed project, during subsequent earth-moving activities, and in residential areas where these soils are present.

2 In the context of public health, environmental health, and worker safety, DTSC suggests that prior to commencement of construction, the site soils be thoroughly characterized in order to avoid exposure of construction workers, future residents and users of the facility to potentially hazardous soils. Due to the highly agricultural nature of the project area, DTSC suggests that these samples be analyzed for pesticides and for petroleum hydrocarbons.

3 Enclosed is an order form for DTSC's Preliminary Endangerment Assessment (PEA) Guidance Manual which details the site characterization procedure. Should Santa Clara County or the project proponent desire, DTSC can enter an agreement whereby DTSC will review the PEA for a fee. This is known as the Voluntary Cleanup Program (VCP).

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D. Response to Department of Toxic Substances Control

1. Comments noted. These hazardous materials issues have been fully evaluated in Section III. N. of the DEIR.

2. Comment noted. As discussed in the DEIR, soil samples would be tested prior to site clearing, with appropriate remediation measures implemented if necessary.

3. Comment noted. No response required

4 DTSC offers other oversight services under the VCP. Prudent businesses employ these services to responsibly manage releases of hazardous substances (and their associated liabilities) while controlling, via an agreement with DTSC, the kind of regulatory services they desire. A fact sheet describing the Voluntary Cleanup Program is enclosed.

If you have any questions, you may call Ben Hargrove at (510) 540-3845.

Sincerely,

Ben Hargrove
Hazardous Substances Engineer
Site Mitigation Branch

Karen M. Toth
Unit Chief
Site Mitigation Branch

Enclosures

cc: (without enclosure)
Guenther Moskat
Department of Toxic Substances Control
Planning and Environmental Analysis Section
P.O. Box 806
Sacramento, California 95812-0806

State Clearinghouse
1400 Tenth Street
Sacramento, California 95812

4. Comment noted. No response required.

E

STATE OF CALIFORNIA—BUSINESS, TRANSPORTATION AND HOUSING AGENCY

PETE WILSON, Governor

DEPARTMENT OF TRANSPORTATION
BOX 23660
OAKLAND, CA 94623-0660
(510) 286-4444
TDD (510) 286-4454

May 1, 1996

SCL-101-R12.46
SCH94043016
SCL101373

Ms. Jaunell Waldo
Office of Advance Planning
County of Santa Clara
County Government Center, East Wing
70 W. Hedding Street
San Jose, CA 95110

Dear Ms. Waldo:

Re: Draft Environmental Impact Report (DEIR): Lion's Gate Reserve

Thank you for including the California State Department of Transportation (Caltrans) in the environmental review process. We have reviewed the above-referenced document and wish to forward the following comments:

1 1. There are a number of deficiencies in the DEIR and appendices which make it difficult to thoroughly review the documents. To begin, there should have been a cumulative impact analysis of the project study intersections for project conditions and all approved projects. On page 8, Table II in Volume III entitled, "Approved Projects Trip Generation," the table indicates that 1,010 trips will be generated by all approved projects. It would then follow that there should have been a discussion of the impacts of ALL projects on U.S. 101, since according to page 159 of Volume I, about 40% of the trips are distributed in the mainline. Please clarify.

2 2. Since the above information was not covered and it appears that so much information is either missing or perhaps mislabeled, we find it hard to accept the conclusions reached that there will be no significant traffic impacts to the study intersections. Is the information presented really valid? We refer to Volume I, page 153, section entitled, "Existing Levels of Service," last sentence in second paragraph refers to "calculations" found in Appendix H. On what page are these calculations?

On the same page, last paragraph at the bottom, section entitled,

E. Response to Department of Transportation

1. The Santa Clara County Congestion Management Agency Guidelines for Traffic Impact Analyses indicates that the scoping criteria for evaluating freeway impacts relates only to the proposed project trips and not the total of approved project trips as suggested in the comment. Specifically, if the proposed project is expected to add traffic volumes which exceed 1 percent of the freeway capacity, then that freeway segment should be included in the analysis. In this case, U.S. 101 near the project site provides two lanes in each direction and the 1 percent threshold is 46 vehicles north of Tennant Avenue. Since the project contribution would be lower than this threshold, no detailed analyses of U.S. 101 were conducted.

2. The detailed intersection analyses are contained in Appendixes A through E of the TJKM Traffic Study, which is contained in Appendix H of the DEIR.

" Background Traffic-Existing Plus Approved Projects," last sentence refers
3 to "a table of these approved projects and a figure...in Appendix G of this EIR." There is no such table in Appendix G, the Historical and Architectural Evaluation section. Could this be a reference to the "missing" Figure 3 in Appendix H?

There are other missing figures in Appendix H, which, again, makes it
4 difficult to adequately review and compare the data. The following are missing :

a. Figure 1: existing transit routes in vicinity of proposed project
b. Figure 3: locations of approved projects near study area
c. Figure 4: project turning movement volumes
d. Figure 6: trip distribution assumptions
e. Figure 7: projected study intersection turning movements for existing plus approved plus project
f. Figure 8: forecasted turning movement volumes

Is it possible that some of the figures in Volume I of the DEIR, i.e., figures 18, 19, or 20, should have been the figures provided in items b, c, d, e above? Please clarify.

We appreciate the opportunity to work with you on this project and wish to continue close correspondence on any new developments. Should you have any questions regarding these comments, please contact Salimah As-Sabur of my staff at (510) 286-5583.

Sincerely,

JOE BROWNE
District Director

By: Phillip Badal

PHILLIP BADAL
District Branch Chief
IGR/CEQA

cc: Dana Lidster, SCH

3. The reference to Appendix G should have read "Appendix H." The table listing the approved projects is identified as Table II of the traffic report in Appendix H. The EIR has been revised to include this corrected information. (See Section *V. TEXT AMENDMENTS.)*

4. Comment acknowledged. All but one of the figures prepared by TJKM for Appendix H were inadvertently omitted from DEIR Volume III. Several of these missing figures appear in Volume I of the DEIR as follows: the missing Figure 1 in Appendix H is the same as Figure 17 in the DEIR; Figure 2 is the same as Figure 18; Figure 4 is the same as Figure 19; Figure 6 is the same as Figure 20; and Figure 7 is the same as Figure 21 in the DEIR. Figures 3 and 8 are missing altogether. The EIR has been amended to include the figures missing from Appendix H. (See Section *V. TEXT AMENDMENTS.)*

F

Santa Clara Valley Water District

5750 ALMADEN EXPRESSWAY
SAN JOSE, CA 95118-3686
TELEPHONE (408) 265-2600
FACSIMILE (408) 266-0271

AN AFFIRMATIVE ACTION EMPLOYER

May 3, 1996

Ms. Juanell Waldo
Santa Clara County Office
of Advance Planning
County Government Center, East Wing
70 West Hedding Street
San Jose, CA 95110

Dear Juanell:

Subject: Draft Environmental Impact Report (DEIR) for the Lions Gate Reserve Golf Course

The District has reviewed the subject document and has the following comments:

Section III E. - Hydrology and Drainage

1 We note that the proposed drainage will be designed to mitigate impacts due to the golf course development and are intended to decrease flooding and runoff impacts on downstream properties. If opportunities are found during the design phase to provide additional detention/retention on site, downstream property owners could be provided additional relief from existing flooding impacts.

2 In conjunction with the design of the drainage facilities, operating rule curves, and a manual for operations, maintenance and management safety should be prepared and provided to this District for review and comment.

3 A District construction permit is required for work adjacent to West Branch Llagas Creek.

Section III F. - Water Quality

4 Page 96, Mitigation 1: This mitigation measure includes the implementation of a comprehensive erosion control program and Storm Water Pollution Prevention Plan (SWPPP). It is stated that the implementation of the SWPPP would be subject to inspection by the Regional Water Quality Control Board (Regional Board) and the Santa Clara ValleyWater District (District).

F. Response to Santa Clara Valley Water District

1. Comment noted. No response required.

2. Comment noted. The details of the drainage design for the project would be worked out during the engineering design process.

3. The requirement for a District construction permit is noted on page 34 of the DEIR.

4. See following page for response.

The District may conduct construction inspection activities at the proposed site in the case that
4 equipment is operated in, or in the immediate vicinity of, a waterway. However, the District does not have the authority to inspect SWPPPs or otherwise oversee their implementation. SWPPPs are prepared and implemented as a provision of the Statewide NPDES General Permit for Discharges of Storm Water Runoff Associated with Construction Activity (General Permit). The Regional Board and/or the State Water Resources Control Board are the agencies with the authority over SWPPPs and other requirements of the General Permit. We recommend that clarification be added to this section to reflect this fact.

Page 98. Impact 4 and Mitigation 4

5 1. The proposed mitigation appears to be sufficient to minimize the impact of nitrogen fertilizers on the groundwater resource.

2. The proposed groundwater monitoring wells are not located in the proposed turfgrass area (see Volume II, Appendix E, Figure 8). To better determine the effects of golf course
6 operations, groundwater monitoring should be conducted *in* the fertilized turfgrass areas not *near* turfgrass areas. Monitoring in turfgrass areas will give a rapid indication of any improper fertilizer application. Vadose zone monitoring (such as the use of suction lysimeters) is also recommended so that problems can be detected before groundwater is
7 impacted.

Section III. P. Water Supply, On-Site Groundwater

8 1. This section references "4 agricultural wells on the site which were previously used for irrigation supply, but are no longer in use."

Please be aware that water supply wells that have not been used for a period of one year or more are considered abandoned and are therefor in violation of District Ordinance 90-1.

District staff will work with the current property owner to bring the wells into compliance.

We appreciate the opportunity to review this document.

Sincerely,

Usha Chatwani

for Sue A. Tippets, P.E.
Supervising Engineer (Acting)
Design Coordination Unit

4. Comment noted. The EIR has been revised to include the corrected information. (See Section *V. TEXT AMENDMENTS.)*

5. Comment noted. No response required.

6. The precise locations of the monitoring wells would be fined-tuned during the ASA process once more hydrogeologic information becomes available. Creating the wells in the turfgrass areas as suggested should not compromise the groundwater information obtained from the site.

7. Monitoring within the vadose zone (the area between the root zone and the water table) is not recommended by Audubon Conservation Services, the preparer of the Environmental Management Plan contained in Appendix C of the DEIR. The disadvantage of using lysimeters is that they provide very localized data for one point in the profile, whereas monitoring of the groundwater provides an integrated sample from all surrounding sources and thus is more representative of the complex soil and water dynamics. To be statistically significant, a large number of lysimeters would need to be installed over a large area. Reliance on a few lysimeters could result in false positive or false negative results, and may not be reflective of conditions a short distance away. This might lead to unnecessary actions in the case of false positives, or failure to take action in the case of false negative results. It is also important to remember that the edge of the turfed area would be almost one-half mile from the eastern site boundary.

8. Comment noted. No response required.

G

County of Santa Clara

Environmental Resources Agency
Department of Environmental Health
Central Office - 2220 Moorpark Avenue, East Wing, Room 100

P.O. Box 26070
San Jose, California 95159-6070
(408) 299-6060 FAX 298-6261

MEMORANDUM

DATE: May 3, 1996

TO: Juanell Waldo

FROM: Art Kaupert AK
Sr. Environmental Health Specialist

SUBJECT: Draft Environmental Impact Report for the Lions Gate Reserve (Hayes Valley) Golf Course

The Department of Environmental Health has reviewed the subject Draft EIR and offers the following comments for your consideration.

1 1. In section III. N. Hazardous Materials it should be noted that closure/removal of the existing underground and above ground chemical/fuel storage tanks must be completed under permit issued by the Department of Environmental Health Hazardous Materials Compliance Division (HMCD). The tanks may not be moved, even for reuse with out HMCD authorization.

2 2. It is stated that the annual wet weather waste water volume plus rainfall can be disposed by irrigation during the eight month dry period. The proposed storage capacity of the waste water storage pond is 90 days, however the wet period is 120 days. The waste storage capacity of the pond should be 120 days of sewage flow plus rainfall. (page 193, Long-term Wet Weather Storage, and page 199, mitigation 4)

G. Response to County of Santa Clara Department of Environmental Health

1. The EIR has been revised to include the suggested information. (See Section *V. TEXT AMENDMENTS.)*

2. The 120-day storage period assumes a very wet winter when no spray irrigation whatsoever will be possible during the rainy season. During such a wet winter, the golf activity would also decrease, resulting in a reduction of wastewater flows. For such a scenario, it is not unrealistic to expect a flow reduction to 18,000 gallons per day, in which case the storage capacity of the pond would provide for 120 days of storage. During the final design of the wastewater facilities, the water balance would be more precisely recalculated to consider 120-day storage for reduced winter flows.

H

County of Santa Clara

Environmental Resources Agency

Integrated Waste Management Program (408) 441-1198
Pollution Prevention Program (408) 441-1195
1735 North First Street, Suite 275
San Jose, California 95112
FAX (408) 441-0365

May 2, 1996

Jaunell Waldo
Santa Clara County Office of Advance Planning
County Government Center, 7th Floor, East Wing
70 W. Hedding Street
San Jose, CA 95110

Subject: Draft Environmental Impact Report for the Lion's Gate Reserve (Hayes Valley) Golf Course (file #4039-67-28-93) SCH #94043016

Dear Ms. Waldo:

1 The Santa Clara County Integrated Waste Management Program has reviewed the Draft Environmental Impact Report for the Lion's Gate Reserve (Hayes Valley) Golf Course (DEIR). We believe the DEIR adequately addresses the issues of waste stream reduction, recycling, composting, collection and disposal, and have no comments.

Thank you for the opportunity to review this project.

Sincerely,

Paula Stoner

Paula Stoner, Management Analyst
Integrated Waste Management Program

H. Response to County of Santa Clara Integrated Waste Management Program

1. Comment noted. No response required.

County of Santa Clara

Environmental Resources Agency
Parks and Recreation Department
298 Garden Hill Drive
Los Gatos, California 95030
(408) 358-3741 FAX 358-3245
Reservations (408) 358-3751 TDD (408) 356-7146

RECEIVED
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96 MAY -2 PM 1:21

April 20, 1996

Jaunell Waldo
Santa Clara County Office of Advance Planning
County Government Center, East Wing
70 W. Hedding Street
San Jose, CA 95110

Subject: **Draft Environmental Impact Report for the Lion's Gate Reserve (Hayes Valley) Golf Course**

Jaunell Waldo:

Following are our comments on the Draft Environmental Impact Report for the Lion's Gate Reserve (Hayes Valley) Golf Course. Our comments are focused on the DEIR's discussion of Parks, Trails and Public Recreation.

1 We have reviewed the subject DEIR. This setting of the document accurately identifies all the existing County Parks in the vicinity of the subject project. This discussion also addresses the fact that there are currently no public trails in the south county connecting these regional public parks. However, the ***Section II, Consistency with Plans, Policies and Regulations*** of the DEIR includes a discussion of the trail routes that are proposed to run parallel to and/or traverse the subject property.

2 Under ***Section III, Parks, Recreation and Open Space - Impacts and Mitigations*** the DEIR states that "*a trail easement for the 2 to 3 mile on-site segment of the proposed San Martin Cross-Valley Trail would be dedicated in conjunction with the project. Segments of two additional trails along the project frontages on Coolidge Avenue and Watsonville Road would be dedicated and improved in conjunction with required roadway dedications and improvements.*" This section also states that the golf course would be open to the public to help alleviate the "*well documented shortage of golf courses in the County.*" With these mitigations in place, we believe that the DEIR has adequately addressed County Parks plans and policies with regard to the project area. Therefore, we have no further comments.

Sincerely,

Julie Bondurant
Park Planner

I. Response to County of Santa Clara Parks and Recreation Department

1. Comment noted. No response required.

2. Comment noted. No response required.

J

THOMAS KRUSE

RECEIVED
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96 MAY -3 PM 2:44

FAX Attention Juanell Waldo

Re: Lions Gate Reserve ~~Goolf~~ Course DEIR File# 4039-67-28-93

Dear Juanell

I am sending this fax in response to the DEIR. In addition to other concerns I have I feel compelled to write about some that I think were not dealt with fully or adequately. I will refer to their letter or number designation in the DEIR and/or appendix;

DEIR Summary B and Appendix B. Agriculture

1 While the developer offers as a mitigation measure the planting of vineyards he does not say how many acres or where they will be located. There would be an enormous difference say between 5 acres of vineyards and 100 acres of vineyards.

Correspondence produced by
Thomas Kruse Winery 4390 Hecker Pass Highway
Gilroy, California 95020 (408) 842-7016
Contents: 750 words in box

Continued

J. Response to County of Santa Clara Planning Commissioner Thomas Kruse

1. This information is provided on page 18 of the DEIR, where it states that 110 acres of vineyard would be planted in two areas: a 10-acre area along the Coolidge Avenue frontage, and a 100-acre area at the western end of the project near Watsonville Road. This information is repeated on page 66 under "Mitigation 1." It should be noted that this mitigation measure has been revised to include vineyards and/or orchards.

The economic analysis done was modeled using hay, walnuts and cattle. The applicant is proposing

2 vineyards as a mitigation measure. An analysis using vineyards as a model should be done. There are about 400 plantable acres on the entire site. Preliminarily I conclude that 5 tons to the acre @ $1200.00 ton less harvest and cultural costs of about $2000.00 per acre would net the operation $1,600,000 per year.

3 Further the consultant -Niles- conclusion where he says "Thus, there is no agricultural operation that could support any of these tax levels" is wrong.

Additionally where he attempts to depict Santa Clara County at a comparative disadvantage in footnote 2 of Appendix B does not demonstrate anything at all. His own orchard is taxed at

2. In response to this comment, Dr. Niles undertook an analysis of a hypothetical vineyard on the Hayes Valley site. This additional analysis has been added to Appendix B of the EIR. (See Section *VI. REVISIONS TO THE APPENDICES OF THE EIR.*) The analysis considered a hypothetical 400 acres of vineyards on the site. Based on current yields and prices, the analysis concluded that it would take at least 10 years before such an operation would reach a break-even position. This is due to the extremely high start-up costs of vineyards, which would total almost $6 million (not including land costs) before the first harvest in the third year of operation. While a vineyard would ultimately be profitable, the conclusion reached was that such an operation would not be financially justified given the opportunity cost of capital and the risk of the operation.

3. The agricultural feasibility report prepared by Dr. Niles was unclear with respect to a key element of the analysis. That is, although the family farm scenarios assumed no land costs and reduced property taxes under the Williamson Act, the cost of starting up a new farming operation was factored into the cost analysis (this latter information was not clearly explained). These start-up costs, which include land preparation, the cost of walnut trees, and the cost of planting, were factored in to make these scenarios somewhat realistic. In the San Joaquin Valley example, there are no such start-up costs to be paid off, and therefore that operation is economically viable while the project case would not be. By the same token, Dr. Niles study was not meant to imply that existing agricultural operations in Santa Clara County are not economically viable, particularly since most of these operations are probably not carrying debt for start-up costs.

$40.00 per acre and the 28 acre parcel he depicts if it was under the Williamson act would be taxed at $41.43 per acre. His depictions of farming are clearly meant to arrive at his conclusion ~~and~~ but a close reading and cursory analysis shows them to be frought with error.

DEIR Summary C Parks, Rec etc.

4 While the dedication of 1265 acres of open space is commendable I think that unless the development rights over the golf course itself - 263 acres - are relinquished the impacts of the project as it is now and the potential for future growth impacts are not sufficiently mitigated. The is a model and a precedent for this type of arrangement.

4. With respect to growth-inducement within the golf course itself, there is a very low probability that the golf course would be redeveloped for another use. Considering the effort and expense of gaining project approval for the golf course, and the huge investment required to construct a premiere facility, it makes no sense to turn around and try to develop the site for something else.

Under the HS zoning, the golf course area could be developed for 13 cluster lots at most, which does not provide a financial incentive for converting the golf course. Any proposal for more intensive development would require a General Plan amendment to Rural Residential, but the General Plan specifically prohibits the creation of new Rural Residential areas or the expansion of existing Rural Residential areas.

The question of whether the development rights to the golf course area should be relinquished is a policy decision, and thus is outside the scope of the EIR.

Page 4

It is my understanding that the City of San Jose and Brandenburg Development are doing just such a contract over their newly proposed golf course.

5 DEIR SUMMARY P and Appendix M Water Supply

Mr. Hix has stated during his presentations that there was not a significant cost difference between pumping water from on site wells or purchasing it from West San Martin Water Co. I don't believe this to be the case. West San Martin sells water only at one rate and other small parcel owners in the area who are connected to West San Martin and have their own well use their own well whenever feasible because of significant cost differences. According to Mr. Upstad of the Water Co. the golf course

5. According to Robert Ukestad, the General Manager of the West San Martin Water Works, any water conveyed to the Lion's Gate project for irrigation purposes would be charged at a bulk rate which is approximately 35 to 42 percent of the rate for domestic supply. (The rate structure is discussed in the June 7 letter from WSMWW which has been added to the EIR. See Section *VI. REVISIONS TO THE APPENDICES OF THE EIR.)* It should be noted that the irrigation water would be piped directly from the water company's wells to the irrigation pond, and would not pass through the water storage tanks since no fire pressure would be required.

will not get a preferred or lower rate. Consequently the golf course - it may be concluded - will try to use their own water whenever possible. This makes it all the

6 more important that it can be demonstrated that there is in fact an adequate supply of water for irrigation on the site. Mr. Hofer of Geoconsultants obtains his information from written data and he says "...these figures are preliminary in nature. In order to assure that the projected supplies are realistic, a detailed aquifer analysis will need to be performed at Lion's Gate Reserve. In addition, it may be necessary to perform further studies in the West San Martin and Twin Valley Areas." Consequently I think that is necessary that

6. As stated in the DEIR, on-site groundwater would provide the primary source of irrigation water but not the only source. On-site groundwater would not be pumped beyond its safe yield. Backup supplies would be provided by West San Martin Water Works, which has an enormous unused supply to draw from without adverse effects to the resource. (In fact, WSMMW could supply all of the irrigation water for the project, if necessary.) In order to determine exactly when to suspend on-site pumping, a down-gradient monitoring well to be located on the site would be monitored constantly during peak pumping periods to observe any drawdown in the water table, which would serve as the indicator of when to suspend on-site pumping and start drawing exclusively from the supplemental sources. In addition, existing off-site wells would also be monitored to ensure that impacts are not occurring to those wells. After the system has been in operation for a period of time, the project geohydrologist would obtain a more refined knowledge of the aquifer characteristics, and would be able to more closely predict available groundwater and plan for water supply augmentation based on the weather conditions and the previous winter's rainfall amount.

concrete steps be taken at this point in
7 the application and EIR process and
not just more theoretical suppositions being
made. The golf course development should
be required to site their wells now and
drill them to test whether or not there is
water. Further, pump tests need to be
performed to substantiate the gallons
available, the quality and other wells
nearby need to be monitored to ascertain
the impaction if any caused by pumping.
8 The DEIR makes reference to average
rainfall of 21 inches with 3½ inches
going to recharge the aquifer. In years
with less than average rainfall what will
be done? I think that the specific yield

7. There is no doubt in the part of Geoconsultants that more than sufficient water supplies are available to serve the project from on-site groundwater, in combination with supplemental supplies from West San Martin Water Works. (The Santa Clara Valley Water District, in a memo dated June 26, 1996, has indicated it concurrence that there is sufficient water available for the project. This memo has been added to the EIR and is included in Section *VI. REVISIONS TO THE APPENDICES OF THE EIR.)* Additional studies would be required prior to construction to define the characteristics of the aquifer, for purposes of determining the number of production wells needed, and their optimum locations, and in particular to establish setback distances for these new wells to ensure that they do not have an impact on off-site wells. There is no doubt on the part of Geoconsultants that there is sufficient area available on the site so that the required production well(s) can be placed in locations where they would not result in off-site impacts. The procedure for performing the detailed water balance study and well drilling is fully described in Section *II. OVERVIEW OF MAIN ISSUES DISCUSSED IN COMMENTS ON DEIR*.

8. See next page for response.

8 data need to be proven and an alternate yield formula for water available (safe yield) needs to be figured out for "drought" years. Empirical data must be obtained before anything else should be allowed to proceed because of the totally water dependent nature of this project.

Thank you for your consideration

Very Truly Yours

Tom Kunsl

8. Specific volumes of groundwater to be pumped each year would vary in accordance with rainfall amounts and recharges rates. The primary indicator for preventing overdraft conditions would be the monitoring wells discussed in Response #6 above. In addition, after the system has been in operation for a period of time, the project geohydrologist would obtain a more refined knowledge of the aquifer characteristics and would be able to more closely plan for water supply augmentations based on weather conditions and the previous winter's rainfall, or lack thereof during drought conditions.

It should also be noted that in the event of prolonged drought, water usage would be cut back in phases as prescribed in a drought contingency plan to be prepared for the project. (See page 189 of the DEIR for a detailed description of the plan.) In addition, approximately 8 percent of the irrigation water would be provided by reclaimed effluent from the package wastewater treatment plant. (As discussed at pages 196-7 of the DEIR, the treated effluent would be applied at rates no greater than evapotranspiration rates, so there would be no surface runoff or seepage below the root zone.)

THOMAS KRUSE

ATT'N JUANELL WALDO

RE: FILE# 4039-67-28-93 LIONS GATE GOLF COURSE

COMMENT ON DEIR APPENDIX N

9 This project as proposed calls for the formation of a CSD, CSA or special district. Additionally the applicant proposes that a wastewater treatment plant be constructed to handle the effluent from septic tanks. This process is precedent setting in Santa Clara County and has the potential of becoming a growth inducing impact on the site and perhaps elsewhere because of the ability to treat waste effluent ~~[illegible]~~ without sewer hookups such as might be the case in urban areas. I think that this makes it all the more important to restrict future development on site by giving up the development rights over the golf course itself.

Very Truly Yours

Tom Kruse

Correspondence produced by
Thomas Kruse Winery 4390 Hecker Pass Highway
Gilroy, California 95020 (408) 842-7016
Comments: 750 words or less

9. The issue of growth inducement on the golf course site itself is addressed in Response #4 above. With respect to expansion of the treatment plant at a later date to accommodate additional flows, it would be difficult to expand the treatment system once it is installed. All of the components of the package wastewater treatment facility would be sized to serve only the Lion's Gate project. That is, the treatment plant capacity would be limited to 30,000 gallons per day, which represents the peak daily flows of the project as proposed. According to Questa Engineering, it would be very difficult if not impossible to add to the system at a later date to accommodate additional development. The proposed treatment plant site is in a constrained location with very limited area available for expansion. Additionally, it would not be possible to expand the effluent disposal pond given its location on top of a knoll, and there are no suitable locations for additional ponds nearby. Also, new pipeline would have to be laid and pump stations added. Moreover, it is unclear what the incentive would be to the homeowners association and the county club for tolerating the inconvenience and nuisance of a system expansion that would not benefit them.

K

County of Santa Clara

Roads and Airports Department

1505 Schallenberger Road
San Jose, California 95131

MEMORANDUM

DATE: April 26, 1996

TO: Jaunell Waldo
Associate Planner

FROM: Ed Evangelista
Land Development and Permits

SUBJECT: Draft EIR

FILE NO.: 4039-67-28-93 (Lion's Gate) Highland Avenue

We have reviewed your March 19, 1996, transmittal along with the attachments for the subject project, and our comments are as follows:

1 (1) The site is located in the area of severe flooding problems. Therefore, we will require that prior to the project's approval, a drainage plan for any impact to County maintained roadway be submitted for our review and approval.

The drainage plan should include drainage calculations prepared by a registered civil engineer and demonstrate that the surface runoff from the site is carried to an acceptable out fall of adequate capacity.

2 (2) We have an existing Official Plan Lines (OPL) along Watsonville Road and Coolidge Avenue. No permanent improvements should be located within the OPL.

At the time of the site development, we will require the developer to dedicate and improve a minimum 30 ft. half street along the site's Watsonville Road, Turlock Avenue, and Highland Avenue frontage. Dedicate and improve the site's frontage along Coolidge Avenue to the minimum 55 ft. half street to the OPL.

3 (3) A County encroachment permit should be obtained prior to the beginning of any work within the County's jurisdiction.

cc: M. Akbarzadeh
A. Chan
File

epe534

K. Response to County of Santa Clara Roads and Airports Department

1. Comment noted. The EIR has been amended to include the revised information. (See Section *V. TEXT AMENDMENTS.)*

2. Comment noted. The referenced Official Plan Lines are discussed on page 161 of the DEIR.

3. Comment noted. This is a standard requirement to be contained in the plans and specifications for the project.

L

CITY OF MORGAN HILL

17555 PEAK AVENUE MORGAN HILL CALIFORNIA 95037

May 3, 1996

Ms. Jaunell Waldo
Santa Clara County Office of Advance Planning
County Government Center, East Wing
70 W. Heading St.
San Jose, CA 95110

RE: Draft Environmental Impact Report for the Lion's Gate Reserve Golf Course.

Dear Ms. Waldo,

Thank you for forwarding a copy of the Lion's Gate Reserve DEIR to the City of Morgan Hill for our review and comment. After reviewing the documents, the City's has some comments/questions that we feel should be addressed in the final EIR document.

First, due to the mutual aid agreement with the City of Morgan Hill, the City believes it is
1 important to retain the proposed mitigations under the Fire Protection section requiring that all structures be sprinklered and all access roadways be of sufficient width to accommodate emergency service vehicles. Additionally, the City believes it is equally important that any tanks necessary to assure adequate water pressure to produce adequate fire flow are in place as part of
2 the construction of the project. It was noticed that on Page 187, Mitigation 1a., Paragraph 2, that the last sentence indicates that when the new tank is completed by the water company, that there would be sufficient capacity to meet the fire flow requirements for the Lion's Gate project. The first sentence in this paragraph indicates that the water company plans to build this tank in the "future." Will this tank be completed before or after the construction of the project? If it is constructed after, will adequate water pressure be available to produce adequate fire flows for the sprinkler systems and on-site hydrants. A similar statement is made on Page 202, in the section titled "Water Supply."

3 Second, there did not appear to be any discussion in the DEIR that addressed the potential failure of the wastewater disposal system and subsequent alternatives. If for some reason the proposed system becomes inoperable or infeasible what other alternatives would be used to service the waste water needs of the project after its built? The DEIR should address this topic as it may impact the City of Morgan Hill.

L. Response to City of Morgan Hill

1. Comment noted. No response required.

2. Mr. Bob Ukestad, the General Manager of the West San Martin Water Works, has indicated that the water storage tank will be complete and operational by mid-1998, when the golf course component of the Lion's Gate project is also scheduled for completion.

3. The planned wastewater system is known to be technically feasible since it is based on proven and well understood technologies, and does not represent a new or experimental process. The treatment system is known to be economically feasible because similar plants are being successfully supported by similar sized service areas elsewhere in the region. In the unlikely event that the treatment plant were to become temporarily inoperable, there are redundancies built into the system to prevent a public health emergency. The individual residences would each have septic tanks which could be pumped out as needed. The system would also include emergency backup generators in the event of power outages, and short-term storage capacity is included in the design of the treatment plant and the lift stations, as well as the septic tanks themselves. In the extremely unlikely event that the plant were to become totally unusable, the residential treatment requirements could be met by installing leachfields at each homesite. (Each lot has been tested for leachfield suitability and meets County requirements.) In such an event, the golf course facilities would have to be shut down until an alternative advanced secondary treatment process, such as recirculating sand filter and community leachfields, could be brought on-line.

4 Finally, the DEIR did not appear to address the impact on the water supply for south county. The proposed project appears to be water intensive. The report appears to discuss the impact to the immediate water suppliers but doesn't addrss the potential impact on the neighboring cities of Morgan Hill and Gilroy. The report should address how this project may impact the City's ability to meet its immediate and future water needs?

If you have any questions regarding my review or comments please call me at (408) 779-7248. Thank you for the opportunity to comment on this project.

Sincerely,

Terry Linder

Terry Linder
Associate Planner

cc: David Jinkens, City Manager
C:\TERRY\WP\MISC\LIONSGAT.LIC

4. Geoconsultants has determined that the combination of on-site pumping at the Lion's Gate site, and the pumping for additional water supply from the West San Martin Water Works would not result in adverse impacts on the respective aquifers being pumped. Since the Cities of Morgan Hill and Gilroy are located some distance from these pumping sites, no impacts would occur to the water supplies for those two cities.

M

May 2, 1996

Juanell Waldo
Santa Clara County Office of Advance Planning
County Government Center, East Wing
70 W. Hedding Street
San Jose, CA 95110

RE: Lion's Gate Reserve (Hayes Valley) DEIR

Dear Juanell,

Thank you for this opportunity to express our concerns regarding the DEIR. Our concerns relate to 1) the overall scale and intensity of the development, 2) possible loopholes regarding the open space dedication, 3) impacts on water supply, 4) the package sewage treatment plant, 5) water quality/ riparian impacts, 6) impacts on biological resources, and 7) inappropriate rationale for loss of agricultural lands.

<u>1) Overall Scale and Intensity Development</u>

1 The Committee For Green Foothills has grave concerns over the unprecedented scale and intensity of this project in a rural unincorporated area miles from any existing urban service area. This project combines recreation, commercial and residential uses and consists of over 850,000 sq. ft. of buildings not including the 41 residences. We find the intensity and scale of this project to be inconsistent with the General Plan on several counts:

2 First, we question whether this project- as proposed- can really be considered non-urban and low density in nature as required by General Plan policy R-GD 2 (which is not mentioned in the EIR) for rural unincorporated areas. Furthermore, we believe that the commercial aspect of this project is not in keeping with the General Plan's strong commitment to limiting urban uses to existing urban
3 service areas.

4 Second, contrary to the statement on p. 212, this project *does* represent a change in the character of the area in that it introduces commercial development into a very rural area. According to the General Plan, this area will *not* be shifting to a "more urban character," as it states in the EIR. Please correct this discrepency.

A regional group working for environmental quality

THE COMMITTEE FOR GREEN FOOTHILLS
Peninsula Conservation Center, 3921 East Bayshore, Palo Alto, California 94303•(415) 968-7243

Recycled Paper

M. Response to Committee for Green Foothills

1. The total floor area contained in the golf course and ancillary uses, and the equestrian center is approximately 114,000 square feet (not including the residences), not 850,000 square feet as stated in the comment.

2. The project cannot be characterized as urban in scale or intensity by any measure. The Floor Area Ratio (ratio of total floor area to total site area) or FAR of the golf course facilities is less than 1 percent of the golf course area compared with typical suburban FARs of 40 to 60 percent for industrial park or commercial retail developments. The FAR of the residential component is approximately 3 percent, compared with 30 to 40 percent for a typical suburban tract subdivision. The impervious surface coverage by the golf course and residential components, including all roads, parking areas, driveways and cart paths, is 6 percent over the 410-acre development area, and 1.5 percent over the entire site area. Compared with 40 to 50 percent for a suburban subdivision and 80 to 95 percent for industrial park or commercial retail development, these coverages reflect a very low intensity of land use. Applying traffic generation is taken as a measure of land use intensity, the total project would generate approximately 1.5 trips per minute during the p.m. peak hour, which is an extremely low rate compared to typical suburban development. These figures demonstrate that the proposed project is indeed non-urban and low-intensity in nature.

3. As discussed in Section II of the DEIR, the proposed project conforms with the "Hillsides" designation of the County General Plan, and the provisions of the Hillside (HS) Zoning District. Section 14-4.2(b) of the HS zoning regulations specifically permit all of the uses proposed including clubhouse, overnight accommodations, swimming pools, tennis courts, and bar and restaurant. Also permitted under HS zoning regulations are corrals and caretakers residences. Thus the proposed project is not considered an inappropriate use for the site according to the applicable County General Plan and zoning requirements.

4. It is important to note that the cumulative impact analysis referenced in the comment took into consideration the approved and pending projects in San Martin and Morgan Hill, which has its southern City limits approximately one mile north of the project site. This is the "area" within which the project could contribute incrementally to cumulative impacts. This area currently includes urban (or suburban) and rural uses, and the overall trend within this area, which is dominated by trends in Morgan Hill, is toward urbanization. However, within the immediate area of the project, it is more accurate to characterize the trend as being a gradual shift from rural agricultural undeveloped land use to developed rural residential land use. This trend has been institutionalized in the San Martin Planning Area policies of the General Plan, which designates most of the area in the project vicinity for Rural Residential development. The DEIR has been amended to add this more specific discussion for the immediate project area. (See Section *V. TEXT AMENDMENTS.)*

Third, Committee for Green Foothills finds the overnight accommodations
5 particularly difficult to justify. As recognized in the EIR, allowing overnight
accommodations in conjunction with a golf course proposal in the hillsides
would be precedent setting, thereby putting the County in a difficult position
when approached with future similar proposals. This should be included in the
Cumulative Impacts section as it would impact all similar proposals in
6 unincorporated hillside land. Furthermore, General Plan policy R-LU 26 requires
that for uses which involve overnight accommodations, the "proposed densities
must be consistent with the scale of the allowed recreational or commercial use."
However, because studies to determine allowable densities of overnight
accommodations have not been completed, this project, if approved, would
7 "stand as the only benchmark of what the County considers an 'appropriate'
development density for such uses." What is the justification for the number of
units proposed? Is the county willing to use this project's proposed density as a
standard for future proposals without conducting any preliminary study?
8 Another point to consider is that allowing overnight accommodations will risk
turning the golf course into a resort for out of town guests, thereby competing
with the purported high local demand for tee-time and decreasing its public
benefit to the local community. Committee for Green Foothills feels that if
indeed there is a documented need for overnight accommodations, they should
be located within the urban service area of Morgan Hill.

9 And fourth, it is almost impossible to visualize the magnitude and extent of this project. The photo simulation on pg. 147 is a pathetic attempt to provide any visual sense of this project. It should be replaced and supplemented with several photo simulations from various viewpoints that provide some realistic visual analysis of this project. In addition, before a decision can be made, a model of this project should be made available to provide decision makers and the public with good visual sense of how this project would impact Hayes Valley and adjacent lands.

<u>2) Open Space Dedication</u>

Although we applaud the dedication of 1,265 acres of open space, we have several concerns regarding the details of this dedication.

10 First, the EIR states that the 1265 acres of open space will be placed in the
ownership of the Homeowners Association formed by the owners of the 41
proposed residences. Is the applicant proposing that the Homeowners
Association hold the easement? If so, this essentially means that the Home
Owners Association can legally undedicate the land as open space at any given
meeting for any given reason. To avoid this loophole and to clarify the intent of
the applicant, we request that the easement be held by the Santa Clara County
11 Open Space Authority. In addition, the land-use limitations on the open space
easement should be clearly defined in the EIR to ensure proper enforcement.

5. As noted under Response #3 above, Section 14-4.2(b) of the County's Hillside zoning regulations specifically permit overnight accommodations within the HS zone. Thus the decision to approve these units would not be precedent setting in the sense that it would lead to proposals for overnight accommodations in areas where they are not currently permitted by County Zoning.

6. On April 18, 1995, the Board of Supervisors approved the recommendation of the Planning Commission that pending golf course use permit applications (specifically the Lion's Gate and Los Gatos County Club projects) not be required to wait for completion of study of "Hillsides" zoning ordinance, as recommended in General Plan implementation recommendation R-LU(i) 9. This implementation was to specify maximum permissible sizes allowed in conjunction with golf courses, including clubhouses, overnight accommodations, and restaurants. The Planning Commission findings in support of the recommendation stated that the two pending golf course proposals did not involve facilities that appear to be out of scale relative to the size of the golf courses. It is important to note that, at that time, the proposed Lion's Gate project included 60 units of overnight accommodation, which has since been scaled back to 45 units.

   The proposed overnight accommodations would be constructed as a series of adobe cottages following the natural contours. Having a low profile with much variation in building planes and rooflines, these units would not appear as a massive hotel but would blend in with the surroundings. The total floor area of the overnight complex would be approximately the same as the clubhouse itself, and thus would be consistent with the scale and character of the clubhouse, which also would be built in the adobe style.

   In addition, as discussed in Response #8 below, overnight guests could make up approximately 50 percent of the total golf rounds, with the remainder comprising daily fee users. Thus the overnight accommodations would not result in turning the golf course into a resort for out-of-town visitors. As such, the scale of the overnight accommodations would be consistent with the scale of the golf course development.

7. The 45-unit figure is the lowest number considered to be economically feasible by Benchmark Hospitality, the firm that would operate the overnight accommodations. Benchmark operates numerous such facilities, including the Squaw Creek Resort at Lake Tahoe and Chaminade in Santa Cruz County. Based on their experience, Benchmark believes a higher number of units could be supported at the site. In fact, the project originally included 60 overnight units, but this was scaled back to 45 units after the 9-hole academy course was eliminated from the plan.

8. With the 45 units of accommodations proposed, overnight guests would comprise an average of approximately 50 percent of the golf rounds. Assuming each room is occupied by two golfers, and assuming 100-percent occupancy, as many as 90 golfers per day could be accommodated here. It is estimated that 50,000 rounds of golf will be played here per year, which yields an average of 137 per day. Thus the overnight guests could comprise a maximum of 66 percent of the average daily golf rounds. The actual percentage is likely to be 50 percent or lower, considering that occupancy rates would likely average 80 percent, and the unlikelihood that each room would house two golfers. In summer, when the number of golf rounds per day could exceed 200, the percentage comprising overnight guests would be lower still.

9. The comment refers to Figure 16 of the DEIR, which is actually an artist's rendering and not a photo-simulation as indicated. The EIR has been revised to reflect this corrected information. (See Section *V. TEXT AMENDMENTS.)* Since the only vantage point from which the project

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would be visible to the public from off-site locations is from the east, the rendering was done from that vantage point. (As noted in the DEIR, there is one private residence with views over the site from the ridge to the north.) The rendering shows that with the landscaped frontage berms in place, very little of the project would be visible from off-site locations to the east.

The homes to the north, near Highland Avenue would be as close as 200 feet from the road, while the majority of the homes would be at least 1,400 feet from the roadway behind the lake. All of the homes would be screened by the landscaped berm along Turlock Avenue, although some homes would be partially visible through occasional breaks in the berm. To the south, the equestrian center would be located at least 300 feet from the roadway, and would be partially visible through breaks in the berm and through the opening for the access road to the equestrian center. Along the frontage of Coolidge Avenue to the north, the homes would be set back at least 300 feet from the roadway and would be screened by landscaped berms and a vineyard or orchard to be planted in the setback area. Some of the homes may be partially visible through breaks in the berm. During the first few years after project completion, the homes and equestrian center along the eastern project frontage would be more visible until the landscaping planted on and along the berms matures to provide the intended visual screening. The rendering shown in Figure 16 (Revised) shows the proposed frontage landscaping in a mature state.

Since no other aspects of the project would be visible from public roadways or inhabited areas, no further illustrations of visual impact are necessary. However, the DEIR does contain site plans for the golf course and the residential areas, as well as renderings of the clubhouse complex, to provide visual illustrations of these aspects of the project. In addition, a model of the project is currently being constructed.

10. The homeowners association would hold title to the open space areas of the hillside cluster development. As stipulated by the County General Plan, a conservation easement over the open space area would be dedicated to the County.

11. With respect to permitted land uses within the open space area, General Plan Policy R-LU 20 states:

> d. land uses allowed within the area dedicated as permanent open space shall be limited to agricultural or other limited resource-related uses, and to non-commercial recreational facilities of an ancillary nature to the cluster residential development and for use by residents only.

In addition, the County's Cluster Permit Ordinance states that the open space shall be "adequate for the recreational and leisure use of the population that will occupy the cluster development..." and that "insofar as possible...natural features of the land are preserved." The applicant proposes to preserve most of the open space area in its natural state, and to utilize portions of the area for vineyards, an equestrian center and horse trails, all of which conform with the applicable policy and ordinance requirements.

Second, as noted in the EIR there is no easement or dedication of development
12 rights over the golf course itself, which means that the course could be
redeveloped at a future date. This growth-inducing possibility is not discussed
in the EIR. To mitigate this impact, we request that an open space easement be
13 placed over the golf course itself, as was done in the Brandenburg Golf Course
planned next to the Calero Reservoir in San Jose.

14 Third, the 1265 acres of open space required by the General Plan includes berms, the equestrian center and residential open space areas as part of the open space acreage. These areas are not, as required by General Plan policy R-LU 20, "configured as large contiguous and usable areas." These areas should be omitted from the open space total acreage and made up elsewhere on the site.

Finally, p. 71 inaccurately states that the Hayes Valley site was identified as low
15 priority for open space preservation. In fact, the site was listed as number 26 out
of 61 sites studied which can not be considered "low" priority.

<u>5) Water Supply</u>

16 The EIR does not clearly and adequately address the fact that Hayes Valley, the site of this project, is its own complete watershed ultimately dependent on direct rainfall for recharge. Because it is isolated, it does not benefit from recharge efforts of the Santa Clara Valley Water District. As this project depends primarily on the withdrawal of on-site ground water, the potential risk of overdraft and the resulting impacts on surface and ground water supply and quality are high.

17 Therefore, it is critical that the annual safe yield estimate be precisely accurate for
this specific site. It is my understanding that the average annual safe yield of
280,000 gpd was based on studies done in 1971 and therefore does not account
for our last two droughts. The EIR itself states in the appendices that "extended
18 periods of heavy rainfall or drought may significantly alter the annualized
average." We request a current study be conducted before finalization of the EIR
to verify the average annual safe yield of 280,000 gpd, which seems impossibly
high. In addition, the safe yield should be adjusted annually to account for
19 varying annual rainfall and resulting recharge levels in order to minimize risk of
overdraft.

20 The number and location of additional on-site wells should be determined before
finalization of the EIR so that their impacts can be thoroughly analyzed and
addressed. This will require that pump-tests be "conducted to gain an
understanding of aquifer characteristics, especially the transmissivity of the
ground water" before EIR certification and project approval. What is the
21 procedure for drilling additional on-site wells in the future?

12. The issue of whether an easement over the golf course is appropriate is a policy question and is not a CEQA issue, and therefore is outside the scope of the EIR.

13. Within respect to the growth-inducement within the golf course itself, there is a very low probability that the golf course would be redeveloped for another use. Considering the effort and expense of gaining project approval for the golf course, and the huge investment required to construct a premiere facility, it makes no sense to turn around and try to develop the site for something else. Under this HS zoning, the golf course area could be developed for 13 cluster lots at most, which does not provide a financial incentive for converting the golf course. Any proposal for more intensive development would require a General Plan amendment to Rural Residential, but the General Plan specifically prohibits the creation of new Rural Residential areas or the expansion of existing Rural Residential areas.

14. The hillside cluster subdivision and the main access road comprise 109.3 acres of the site. The amount of open space required to fulfill the 90 percent requirement is 983.7 acres. The proposed open space area comprises 1,265.7 acres, which represents an excess of 282 acres above the required amount of open space. It is clear from reviewing the project site plan that there is far more than the required 983.7 acres "configured as large, contiguous and usable areas" as stipulated in General Plan Policy R-LU 20. The project includes within the permanent open space areas approximately 60 acres to be used for landscaped berms, buffer areas, the equestrian center and the lake. These areas are included because they are also intended to be owned and managed by the homeowners association. It should also be noted that the above policy language refers to "areas," indicating that the open space area need not comprise a single contiguous area.

15. The Open Space Preservation report covers a total of 61 study areas, but not all of these study areas contain open space areas targeted for preservation, of which there are only 42. A ranking of 26 out of 42 places the Hayes Valley site is in the mid-range of priority for open space acquisition. The EIR has been revised to incorporate this new language. (See Section *V. TEXT AMENDMENTS.)*

16. As stated in the DEIR, the primary source of irrigation water would be from on-site groundwater, but this source would not be pumped beyond its safe yield. Backup supplies would be provided by Twin Valley, Inc., and West San Martin Water Works, the latter of which has an enormous unused supply to draw from without adverse affects to the resource.

17. The estimate of 280,000 gpd is a very conservative preliminary estimate, and the actual safe yield is probably higher. The precise safe yield would be determined prior to project construction. In addition, down-gradient groundwater levels would be monitored regularly during project operation to ensure pumping does not lower the water table for downstream users.

18. The rainfall information cited from Rantz (1971) consisted of an isohyetal (rainfall contour) map of the greater Bay Area. The precipitation values were based on specific gauges throughout the area, and represent the average rainfall for the 50-year period between 1906 and 1956. Although this study has not been updated since then, the gauges have continued to monitor rainfall. There is no precipitation gauge currently installed at the site; however, a gauge in Gilroy has determined average annual rainfall to be 20 inches for the period of 1957 through 1994. Rantz's isohyetal map showed rainfall at Gilroy to also be 20 inches for the period form 1906 to 1956. Therefore, due to the proximity of Gilroy to the site (roughly 4 miles), it can be assumed that the annual rainfall for Hayes Valley has also continued to be the same since 1956. Therefore, the

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average annual safe yield of 280,000 gallons per day calculated in the preliminary groundwater study is based on reliable rainfall data.

19. As part of project operations, a down-gradient monitoring well to be located on the site would be monitored constantly during peak pumping periods to observe any drawdown in the water table. This would serve as the indicator of when to suspend on-site pumping and start drawing exclusively from the supplemental source. In addition, existing off-site wells would also be monitored to ensure that impacts are not occurring to those wells. After the system has been in operation for a period of time, the project geohydrologist would obtain a more refined knowledge of the aquifer characteristics, and would be able to more closely predict available groundwater, and plan for water supply augmentation based on the weather conditions and the previous winter's rainfall amount.

20. There is no doubt on the part of Geoconsultants that more than sufficient water supplies are available to serve the project from on-site groundwater, in combination with supplemental supplies from West San Martin Water Works. (The Santa Clara Valley Water District, in a memo dated June 26, 1996, has indicated it concurrence that there is sufficient water available for the project. This memo has been added to the EIR and is included in Section *VI. REVISIONS TO THE APPENDICES OF THE EIR.)* Additional studies would be required prior to construction to define the characteristics of the aquifer, to determine the location(s) of production well(s), and in particular to establish setback distances for these new wells to ensure that they do not have an impact on off-site wells. There is no doubt on the part of Geoconsultants that there is sufficient area available on the site so that the required production well(s) can be placed in locations where they would not result in off-site impact.

21. The procedure for performing the detailed water balance study and well drilling is fully described in Section *II. OVERVIEW OF MAIN ISSUES DISCUSSED IN COMMENTS ON DEIR.*

A portion of the water required for this project would be supplied by West San
22 Martin Water Works. Is this source dependent on the construction of the new
300,000 gallon water tank? Has this project been approved? When will it be
completed? is project dependent on new 300,000 tank water project. Will this
23 project go through, If so when will it be completed?

24 The project calls for at least 2 proposed detention ponds, the rerouting, piping
and filling of tributaries, and over 850,000 sq. ft. of impervious surfaces not
including the 41 residences. How will this affect creek flow, ground water
25 recharge and, ultimately, the average annual safe yield?

<u>3) Package Sewage Treatment Plant</u>

26 The Committee for Green Foothills has grave doubts about the wisdom and
efficacy in approving an alternative package sewage treatment plant for this
project as it would set a dangerous precedent for other large rural projects and
result in severe growth inducing impacts. Ultimately, these systems- unlike
septic or municipal sewage systems- can accommodate unlimited growth in
remote areas outside urban service areas. To date, the Regional Water Quality
27 Control Board has not approved an on-site treatment plant for a project of this
scale or intensity in Santa Clara County. In addition, studies required by CEQA
to evaluate the cumulative impact of residential use of alternative systems have
28 yet to be completed.

Nowhere in this EIR is the precedent setting nature and growth inducing aspects
29 of this system addressed. The General Plan attempts to limit the growth
inducing impacts of these systems on *residential development* by requiring that
they be built only if and where traditional septic systems could serve the project.
However there are no growth inducing limitations on these systems for
commercial development(i.e.. the golf course, clubhouse, pool and tennis courts,
overnight accommodations, conference centers, equestrian center, etc.). How
30 will the growth inducing and precedent setting aspect of this system on
commercial development be mitigated? Could the non-residential component of
31 this project be accommodated by septic? If not, what is the package sewage
treatment plant alternative? What are the restrictions on increasing the size of
32 the system once the project is approved (i.e.. could it be expanded to serve
existing and future residential units in San Martin)?

33 The precedent setting nature of this system is exacerbated by the creation of a
Community Services District (CSD) for the purpose of owning and operating the
system. Forming a CSD is essentially like setting up a new town- a new urban
service area. A CSD is a quasi-governmental agency that can provide numerous
functions besides sewer such as water, fire, recreation etc. for a designated area.
Would this CSD provide other services besides sewer? What would limit the
34 CSD from providing other services and what would prevent it from expanding
its boundaries? As noted in the EIR, the CSD and its boundary must be

22. West San Martin Water Works would supply all of the domestic water for the project, and would serve as a backup source for irrigation water. Domestic water supplies would originate from off-site tanks to provide the required fire flows and pressure. Irrigation supplies, which have no minimum flow or pressure requirements, would be conveyed directly to the on-site irrigation storage pond.

23. Bob Ukestad, the General Manager of West San Martin Water Works, indicate in a letter dated June 7, 1996 that the water tank will be complete and operational by mid-1998, which is also when the Lion's Gate golf course is scheduled for completion. The letter has been added to Appendix M of the EIR. (See Section *VI. REVISIONS TO THE APPENDICES OF THE EIR.)*

24. As mentioned, the project includes a total floor area of approximately 114,000 square feet (including the golf course and ancillary uses, and the equestrian center, but not the residences), not 850,000 square feet as cited in the comment.

25. The total impervious surface coverage of the site would represent 1.5 percent of the total site area. These changes, together with the piping and rerouting of some tributary drainages, would have negligible effects upon groundwater recharge and safe yield. Except for the treated effluent storage pond and the equestrian facility retention pond, none of the on-site ponds, lakes and basins would be lined, so they would help facilitate recharge rather than impede it.

26. Comments noted. It was recommended by the County Department of Environmental Health and the Regional Water Quality Control Board that the project utilize a package treatment plant instead of conventional leachfield systems. In addition, the Llagas Groundwater Basin Nitrate Study by the Santa Clara Valley Water District recommends the use of package treatment plants for residential developments in order to limit nitrate loadings from individual septic systems.

27. On-site package treatment plants are routinely approved by the Central Coast Regional Water Quality Control Board. To date, the Regional Board has approved 10 to 15 such plants in the neighboring counties of San Benito, Santa Cruz and Monterey. These treatment plants are being monitored by the Regional Board, which has found that they are operating satisfactorily, and meeting all the discharge requirements, as well as producing a high quality of effluent.

28. The County is precluded from approving alternative wastewater disposal systems for individual dwellings. There is no such prohibition on package plants, which are administered by the Regional Water Quality Control Board and the County Department of Environmental Health, as long as conventional septic systems would be feasible under County requirements and standards.

29. As noted, golf courses and ancillary uses are permitted in the HS zoning district. The decisions whether to approve future golf course projects with package treatment plants elsewhere in the County rests with the County decision-makers, and would be based on thorough environmental review for those projects. It is impossible to guess whether, where and when such future projects might be proposed, and any attempt to analyse the growth-inducing impacts of such unknown projects would be purely speculative and thus would not be required under CEQA.

30. Any future projects would be subject to the County's environmental review process, through which project-specific mitigation measures would be identified for implementation in conjunction with project construction.

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31. Septic systems with leachfields were not specifically investigated for the golf course component of the Lion's Gate project. An enhanced treatment process was determined to be more appropriate for this project, particularly since the County's nitrate study of the Llagas Groundwater Basin specifically recommends the use of package treatment plants instead of conventional leachfield systems. An alternative method of enhanced treatment might be a recirculating sand filtration system, where in the effluent is filtered through a sand mound before being disposed of in a community leachfield or by spray irrigation. These systems are in use at commercial land uses elsewhere in the County.

32. As a practical matter it would be difficult to expand the treatment system once it is installed. All of the components of the package wastewater treatment facility would be sized to serve only the Lion's Gate project. That is, the treatment capacity would be limited to 30,000 gallons per day, which represents the peak daily flows from the project as proposed. It would be very difficult, if not impossible, to add to the system at a later date to accommodate additional development. The proposed treatment plant site is in a constrained location with very limited area available for expansion. Additionally, it is not possible to expand the effluent disposal pond given its location on top of a knoll and there are no suitable locations for additional ponds nearby. Also, new pipeline would have to be laid and pump stations added. Moreover, it is unclear what the incentive would be to the homeowners association and the country club for tolerating the inconvenience and nuisance of a system expansion that would not benefit them.

33. The CSD is permitted by law to provide additional services besides wastewater collection, treatment and disposal. The CSD for the Lion's Gate project may also provide for maintenance of streets, storm drains, lighting and landscaping.

34. Any boundary adjustment for the CSD would require LAFCO approval and discretionary approval by the County for any new project to be included in the CSD. At the time that the boundaries of the CSD are set, LAFCO would also establish a Sphere of Influence for the CSD. Since the objective would be to prevent future expansion of the CSD, the Sphere of Influence boundaries would be made coterminous with the CSD boundary. Any request from property owners outside the CSD for a boundary expansion or annexation to the CSD would require a showing of compliance with the policies governing such annexations, as well as the policies governing expansions of Spheres of Influence. The board of directors of the CSD would almost certainly oppose any such annexation request, which would have significant influence on LAFCO's decision regarding any such requests.

35 approved by LAFCO. What are LAFCO's thoughts on the creation of this new
service district? According to state policy, one of LAFCO's primary purposes is
to *discourage* the creation of new districts. What is the alternative to creating a
36 CSD? The precedent and growth inducing impacts of this CSD should be
addressed in the EIR.

37

In addition, it should be specifically stated in the EIR that this agency resumes
38 <u>fiscal</u> responsibility in the case of failure which is common and extremely costly,
often necessitating public dollars (which the county does not have) to absorb the
costs or the environmental cleanup costs stemming from the failure.

<u>4) Riparian Impacts</u>

While we commend the riparian enhancement and restoration programs,
Committee for Green Foothills believes that the EIR underestimates the projects'
impacts on riparian corridors. On p. 27, it states that "the project largely
incorporates the existing natural drainage system into the design of the golf
39 course and residential areas." However it goes on to say that "there are several
instances where short reaches of tributary drainages would be rerouted or piped
to accommodate fairway layout and small existing meanders would be
removed." Where exactly would this occur? How is this justified and could this
be avoided? The EIR later states that the project will result in a loss of 1.7 acres of
40 riparian vegetation, of which .4 acres would become non-riparian due to
diversion or filling of channels. How will this affect species dependent on these
wildlife corridors? In addition, the project calls for 13 stream crossings. After
41 touring several golf courses with the Golf Course Environmental Design
Guidelines Committee this seems significant and is not consistent with the
interim Guidelines. These impacts on riparian corridors are of great concern and
should be further addressed.

42 <u>5) Impacts on Biological Resources</u>

There is no EIR discussion of how this project will impact wildlife corridors and
the wildlife dependent on those corridors. The EIR also lacks a wildlife
management plan for controlling wildlife on the golf course (i.e.. how will deer
43 foraging and ground squirrel problems be managed?). Both these issues need to
be addressed in the FIER.

<u>6) Inappropriate Rationale for Loss of Agricultural Lands</u>

44 While we accept the planting of 110 acres of vineyards as a mitigation for the loss
of 110 acres of prime farmland, we do not accept the rationale of "lack of
economic viability" as decreasing the impact of this loss. How does economic
45 viability reduce the impact of the loss of 110 acres of fertile agricultural land?.
This reasoning sets a dangerous precedent for rationalizing the loss of all prime

35. LAFCO's decision to approve the formation of a CSD would require a showing of compliance with the LAFCO policies governing such formations. In general, the proposed CSD must satisfy the criteria that the formation of the CSD is the most feasible administrative solution available. The DEIR has been revised to include an analysis of the proposed CSD in terms of the LAFCO guidelines and policies governing the formation of CSDs (see Section *V. TEXT AMENDMENTS*).

36. It should be noted that the creation of the proposed CSD was originally suggested by the Department of Environmental Health and the Regional Water Quality Control Board as an effective mechanism for ensuring the proper long-term operation and maintenance of the treatment facility. The treatment plant could be operated by a private entity if only the golf course were to be served. But where multiple ownerships are involved, as with the Lion's Gate project, the facility must be managed by a public entity. Other potential solutions include annexation to an existing incorporated city, or the formation of a County Service Area or CSA; however, the County is not willing or able to administer such entities.

37. The creation of a CSD, in and of itself, is not growth-inducing. A CSD is only a mechanism for effective implementation of long-term operation and maintenance for facilities that have already been approved by the County decision-makers. As noted above, the boundaries of CSDs are strictly circumscribed, and any future expansion to accommodate new development would require approval of the County and LAFCO.

38. It is not accurate to state that failures of community-scale package treatment plants are common. On the contrary, package treatment plants are being looked to as alternatives for avoiding failures of individual septic systems, which is all too common. Package treatment plants require discharge permits from the Regional Board and approval by County Health, and must be operated by a licensed professional. It is important to note that the treatment plant proposed does not represent a new or experimental technology, but is made up of components and processes that are proven and well understood. There is always the possibility of a breakdown of individual system components, such as a pipe break or a pump failure, which can be readily dealt with, but the potential for a complete catastrophic system breakdown is extremely remote. The treatment plant would be operated by trained professionals, and there would be a maintenance and operation fund to cover maintenance and repairs.

39. With respect to the meanders, there are actually no plans to remove the existing oxbow and meander from the main creek channel. The DEIR erroneously stated that the meanders would be removed, a conclusion which was based on a review of the overall golf course plan. However, the more detailed grading and drainage plans do not show grading or vegetation removal in the vicinity of these meanders. The golf course designer, Robert Trent Jones II, confirmed that these meanders would not be removed, and that they were simply omitted from the more general overall site plan. The EIR has been revised to incorporate this corrected information. (See Section *V. TEXT AMENDMENTS.*)

    The tributary drainages to be partially realigned or piped are located on Holes 2, 3, 4, 5, 17 and 18. These intermittent tributary drainages appear as grassy swales, and the minor piping or realignment of some of these drainages would result in the loss of 0.33 acres of riparian woodland. These minor alterations are necessary for the feasibility of the golf course design.

40. As stated in the DEIR at page 125, without mitigation the loss of riparian vegetation would reduce the value of the riparian habitat. The implementation of the riparian restoration and enhancement plan would provide full mitigation for the loss of riparian habitat. In addition, the

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removal of cattle from the site would eliminate a major source of riparian habitat degradation from the site.

41. Subsequent to the release of the DEIR, the applicant revised the golf course plan to eliminate 5 golf cart bridges, leaving 8 cart bridges and 2 roadway crossings. (See revised Figures 9b and 10a in Section *V. TEXT AMENDMENTS.*) These proposed crossings were sited to avoid existing riparian woodland. Bridges would all span the creek channel to allow for wildlife movement underneath. Since the crossings would all occur in areas where the existing habitat is degraded, the impacts would be minimized.

42. According to H. T. Harvey and Associates, the loss of riparian vegetation would have a minimal effect on the wildlife corridor. The existing creekside areas are very degraded and have little riparian vegetation, and are mainly occupied by species typical of the adjacent non-native grassland areas.

43. Ground squirrels are currently not very prevalent on the site. If they become a problem for the golf course, they could be controlled by trapping or species-specific eradication in a manner that does not have secondary impacts to other species. Deer are not a problem for golf course fairways or greens, but they could browse on landscaping. If that becomes a problem, protective fencing would be installed for landscaping.

44. The analysis of agricultural economics was performed by Dr. James A. Niles, formerly chairman of the Agribusiness Institute at the University of Santa Clara. Dr. Niles' analysis shows the marginal viability of new agricultural operations in South Santa Clara County even under the most favorable conditions (e.g., no land carrying costs and reduced property taxes under the Williamson Act), neither of which apply to the Lion's Gate property. However, the analysis did take into account the debt incurred in starting an agricultural operation. This would not apply to ongoing agricultural operations, which would therefore be in a more favorable financial situation.

45. Comment acknowledged. The EIR has been revised to eliminate the reference (at pages ii and 67) of economic non-viability as mitigating the impact of the loss of prime farmland. (See Section *V. TEXT AMENDMENTS.)* However, it is valid to state that the lack of economic feasibility of agricultural production on this site reduces the severity of the agricultural impact of this project.

agricultural lands in Santa Clara County. We request that this reference on pages 50, 67 and 212 and Appendix B be omitted from the FEIR.

46 In closing, we urge that the decision-making process be given sufficient time to carefully consider all the possible long-term ramifications of this project. Due to its unprecedented nature in several respects, it would not be wise to make a hasty decision without thorough study and evaluation of the potential consequences of this project on both the proposed site and future county land-use decisions.

Sincerely,

Camas Hubenthal

Camas Hubenthal
Legislative Advocate

46. Comment noted. No response required.

N

Greenbelt Alliance

PEOPLE FOR OPEN SPACE

May 2, 1996

Juanell Waldo
Santa Clara County Office of Advance Planning
County Government Center, East Wing
70 W. Hedding Street
San Jose, CA 95110

Re: Lion's Gate Reserve (Hayes Valley) DEIR

Dear Juanell:

We appreciate the opportunity to comment on the Hayes Valley DEIR. We have a number of concerns regarding this project and would like them to be thoroughly addressed through the Final EIR.

Issue #1: The overall scale of the development is not consistent with the County General Plan

Although we applaud the permanent open space designation for 1,265 acres out of the 1,676
1 acre site, that still leaves over 400 acres of development, covering 25 percent of the site and most
of the actual Hayes Valley itself. We believe the scale of the ancillary facilities, when combined
with the housing cluster, go beyond the County General Plan's intent to keep the area rural. We
do not believe that the project consisting of 45 units of overnight accomodations, 41 houses, a 250
space parking lot, a million square feet of grading, a total of over 85,000 square feet of buildings
including a 29,000 square foot clubhouse and a 6,000 square foot maintenance facility constitutes a
"low intensity" recreational development. The overall mass of the clubhouse and adjacent
overnight cottages is quite large.

The County General Plan (R-LU 16) states that Hillsides should be "preserved largely in
natural resource-related and open space uses in order to support and enhance rural character",
2 while R-LU 18 states that allowable uses include "parks and low-density recreational uses and
facilities and commercial...uses which by their nature require remote, rural settings; or which
support the recreational or productive use, study or appreciation of the natural environment." R-
LU 25 goes on to state that non residential land uses allowed in hillsides areas shall be of a
3 "generally low density or low intensity nature, depending on the use, as is consistent with the basic
intent of the hillsides designation to preserve the resources and rural character of the land."

The DEIR states that "...the proposed ancillary development to the golf course, particularly the
clubhouse/overnight accomodations, conforms with the intent of the General Plan and Hillside
zoning ordinance that such development be low in density and intensity, in keeping with the rural
4 character of the area....". The DEIR further states, "The number of units is not inconsistent with
the scale of the overall project and the proposal to situate units on the side of the lower foothills
minimizes their intrusiveness and bulk." We disagree with these statements and would like to
5 see some evidence of this. The DEIR is lacking any realistic visual analysis of the project such as
a computer simulated overlay of the development areas on the existing landscape. The only attempt
at this was a woefully inadequate photo simulation (page 147, figure 16) which looks like little
white blotches on a fuzzy photo taken from one location. Before a decision can be made whether
continued

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N. Response to Greenbelt Alliance

1. Although the proposed development area includes a 410-acre area of the site (including the 263-acre golf course), the actual coverage of this area is quite small and cannot be considered as anything but low-intensity. The Floor Area Ratio (ratio of total floor area to total site area) or FAR of the golf course facilities is less than 1 percent of the golf course area, compared with typical suburban FARs of 40 to 60 percent for industrial park or commercial retail developments. The FAR of the residential component is approximately 3 percent, compared with 30 to 40 percent for a typical suburban tract subdivision. The impervious surface coverage by the golf course and residential components, including all structures, roads, parking areas, driveways and cart paths is 6 percent over the 410-acre development area, and 1.5 percent over the entire project area. Compared with 40 to 50 percent for industrial park or commercial retail development, these coverages reflect a very low intensity of land use. Applying traffic generation as a measure of land use intensity, the total project would generate approximately 1.5 trips per minute during the p.m. peak hour, which is an extremely low rate compared to typical suburban development. These figures demonstrate that the proposed project is indeed low-intensity in nature.

2. As discussed in Section II of the DEIR, the proposed project conforms with the "Hillsides" designation of the County General Plan, and the provisions of the Hillside (HS) Zoning District. Section 14-4.2(b) of the HS zoning regulations specifically permits all of the uses proposed including clubhouse, overnight accommodations, swimming pool, tennis courts, and bar and restaurant. Also permitted under HS zoning regulations are corrals and caretakers residences. Thus the proposed project is not an inappropriate use for the site according to the applicable County General Plan and zoning requirements.

3. As discussed under Response #1 above, the proposed project represents a very low intensity use of the site.

4. On April 18, 1995, the Board of Supervisors approved the recommendation of the Planning Commission that pending golf course use permit applications (specifically the Lion's Gate and Los Gatos County Club projects) not be required to wait for completion of study of "Hillsides" zoning ordinance, as recommended in General Plan implementation recommendation R-LU(i) 9. This implementation was to specify maximum permissible sizes of facilities allowed in conjunction with golf courses, including clubhouses, overnight accommodations, and restaurants. The Planning Commission findings in support of the recommendation stated that the golf course proposals did not involve facilities that appeared to be out of scale relative to the size of the golf courses. It is important to note that, at that time, the proposed Lion's Gate project included 60 units of overnight accommodation, which has since been scaled back to 45 units.

   The finding required in the HS portion of the zoning ordinance to determine the appropriateness of the overnight accommodations is that they be "consistent with both the scale of the golf course development and the rural character of the zoning district." The proposed overnight accommodations would be constructed as a series of adobe cottages following the natural contours. Having a low profile and with much variation in building planes and rooflines, these units would not appear as a massive hotel but would blend in with the surroundings. The total floor area of the overnight complex would be approximately the same as the clubhouse itself, and thus would be consistent with the scale and character of the clubhouse, which also would be built in the adobe style. It should also be noted that the original proposal included 60 overnight

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units, but this was scaled back to 45 units when the 9-hole academy course was eliminated from the project.

In addition, overnight guests could make up approximately 50 percent of the total golf rounds, with the remainder comprising daily fee users. Thus the overnight accommodations would not result in turning the golf course into a resort for out-of-town visitors. As such, the scale of the overnight accommodations would be consistent with the scale of the golf course development.

5. The comment refers to Figure 16 of the DEIR, which is an artist's rendering. Since the only vantage point from which the project would be visible to the public from off-site locations is from the east, the rendering was done from that vantage point. (As noted in the DEIR, there is one private residence with views over the site from the ridge to the north.) The rendering shows that with the landscaped frontage berms in place, very little of the project would be visible from off-site locations to the east. The homes to north, near Highland Avenue would be as close as 200 feet from the road, while the majority of the homes would be at least 1,400 feet from the roadway behind the lake. All of the homes would be screened by the landscaped berm along Turlock Avenue, although some homes would be partially visible through occasional breaks in the berm. To the south, the equestrian center would be located at least 300 feet from the roadway, and would be partially visible through breaks in the berm and through the opening for the access road to the equestrian center. Along the frontage of Coolidge Avenue to the north, the homes would be set back at least 300 feet from the roadway and would be screened by landscaped berms and a vineyard or orchard to be planted in the setback area. Some of the homes may be partially visible through breaks in the berm. During the first few years after project completion, the homes and equestrian center along the eastern project frontage would be more visible until the landscaping planted on and along the berms matures to provide the intended visual screening. The rendering shown in Figure 16 shows frontage landscaping in a mature state. Since no other aspects of the project would be visible from public roadways or inhabited areas, no further illustrations of visual impact are necessary. However, the DEIR does contain site plans for the golf course and the residential areas, as well as renderings of the clubhouse complex to provide visual illustrations of these aspects of the project.

6 this project is truly "low-intensity", decisionmakers must have a much better visual sense of its
bulk within the context of the setting.

In addition, we have no way of judging whether any number of units of overnight
7 accomodations is consistent with the scale of the overall project since the County has not completed
its study to determine an appropriate density for overnight accomodations. We believe that if there
is a need for overnight accomodations, they would be better situated in Morgan Hill where other
services and infrastructure is already in place and where the project could benefit the City's local
economy and its downtown. Overnight accomodations on this site, we believe, unneccessarily
push the overall scale of this development beyond a low intensity and rural character enhancing
development.

8 One additional General Plan policy, R-PR 14, states: Privately owned recreational lands uses
and facilities within rural unincorporated areas, ...should be compatible with the landscape and
resources of thc areas in which they are proposed. To ensure such compatibility, potentially
significant impacts often associated with such land uses should be avoided or reduced to less than
significant levels, including *(edited for brevity)*:

- water demand
- traffic generation
- waste water generation and disposal
- alteration of the natural topography, drainage patterns
- visual impacts

We disagree that these five areas have been reduced to less than significant levels.

<u>Issue #2: To adequately address the overall growth inducing impact of the development, an open space easement should be required over the golf course parcel and a more careful analysis is needed on the impact of the package sewage treatment plant and community service district</u>

9 On page 43, the DEIR states that the project proposes no dedication of development rights,
conservation or open space easements over the lands intended for the golf course. Although
technically and legally, the County cannot require this, we strongly urge the applicant to allow an
open space easement over the golf course similar to the Brandenburg Golf Course planned next to
the Calero Reservoir in San Jose. If the developer does not plan on expanding housing or other
development onto the golf course, then we do not see any reason not to voluntarily offer an open
space easement to put to rest the concern over potential future development along the golf course.

10 The growth inducing impacts of the package sewage treatment plant and community services
district has not be adequately analyzed. What would prevent a new community services district
11 from expanding its scope in the future and servicing more development in the area?

<u>Issue #3: A portion of the permanent open space area does not meet County standards</u>

The permanent open space areas around the cluster subdivision should not be counted towardthe
90 percent total as it is tucked in an around residential development and not contiguous to the other
12 large area of open space. The public value of this is very small, and aside from providing space
for berms along the roadway, it primarily serves to benefit the homeowners or the golf course.
The 40 plus acres in the southeast corner includes a buffer area around the residential lots, a 4-foot
berm along Turlock Avenue, a 20 acre lake and a 20 acre equestrian center. How does the
equestrian center and the caretaker's residence constitute dedicated open space? The berms should
be required anyway for visual roadside mitigation, the lakes serve the housing development and the

6. The issue of project intensity is discussed in Response #4 above.

7. The 45 units of single-story overnight accommodation would comprise approximately 34,000 square feet of floor area. This represents 0.3 percent of the total golf course area, 0.2 percent of the total development area, and 0.05 percent of the total site area. This does not represent 'urban' scale or intensity, or a development that would significantly affect the rural character of the area, particularly considering that the overnight units would not be visible to the public from off-site locations. (See also Response #4 above.)

8. The five topic areas enumerated in the comment have all been fully addressed in the EIR, which includes mitigation measures to reduce all potential impacts to less-than significant levels. Without more specific information on particular points of disagreement, it is impossible to respond in further detail to this comment.

9. Comment noted. No response required.

10. All of the components of the package wastewater treatment facility would be sized to serve only the Lion's Gate project. It would be very difficult if not impossible to add to the system at a later date to accommodate additional development. The proposed treatment plant site is in a constrained location with very limited area available for expansion. Additionally, it would not be possible to expand the effluent disposal pond, and there are no suitable locations for additional ponds nearby. Also, new pipeline would have to be laid and pump stations added. Moreover, it is unclear what the incentive would be to the homeowners association and the country club for tolerating the inconvenience and nuisance of a system expansion that would not benefit them.

11. The Community Services District could increase the scope of its activities within its boundaries to encompass services such as the maintenance of streets, storm drains, lighting and landscaping. The boundaries of the CSD could not be expanded without approval from LAFCO.

12. The hillside cluster subdivision and main access road comprise 109.3 acres of the site. The amount of open space required to fulfill the 90 percent requirement is 983.7 acres. The proposed open space area comprises 1,265.7 acres, which represents an excess of 282 acres above the required amount of open space. It is clear from reviewing the project site plan that there is far more than the required 983.7 acres "configured as large, contiguous and usable areas" as stipulated in General Plan Policy R-LU 20. The project includes within the permanent open space areas approximately 60 acres to be used for landscaped berms, buffer areas, the equestrian center and the lake. These areas are included because they are also intended to be owned and managed by the homeowners association. It should also be noted that the above policy language refers to "areas," indicating that the open space area need not comprise a single contiguous area.

golf course, the equestrian center serves only the housing development and the other open space in between benefits only the housing development. Why should this be included as part of the 90 percent dedicated open space with such minimal public benefit?

The County General Plan states in R-LU 20 that "those portions of the land permanently preserved as open space shall be configured as large, continguous and usable areas. This portion (southeast corner) of the dedicated open space does not meet this criteria and should not be counted toward the 90 percent total. An equivalent number of acres should be found to add to the contiguous portion of open space.

<u>Issue #4: The terms of the open space easement have not been described</u>

13 We believe it is important to have the actual restrictions on the open space easement spelled out clearly. We assume the County would hold the easement, but would recommend that it be jointly held by the Santa Clara County Open Space Authority.

<u>Issue #5: The traffic impact analysis is not sufficient</u>

14 Lacking from the analysis is the traffic impact during the time that children are going to school. The Final EIR should also include the expected daily and annual average number of trips and include evening events at the clubhouse and what impact an increase traffic flow would have on the local community when large events are planned.

<u>Issue #6 Rationale for loss of agricultural lands is not appropriate</u>

On page 50 of the DEIR, we disagree with the statement that the loss of ag lands is not
significant because the site is "Not economically viable for cultivation." We do not agree with the
analysis on page 67 (supported by the analysis in the appendix) that this farm would cover costs,
at best, with no return on investment. Depending on a whole host of variables, farming can be
15 economically viable in the South County. This argument can and has been made to justify the
wholesale conversion of prime agricultural lands all around the South County. Year after year,
farmers who wish to cash out and develop their land list a litany of reasons why their land can't be
farmed anymore. Virtually any parcel of agricultural land can be studied with the same conclusion
depending on what factors are used in the analysis. We request that the reference of lack of
economic viability on page 50, 67 and 212 be omitted from the FEIR.

16 We also disagree witht the statement on page 66 that the "use of a 20 acre portion of the (farm)field for the equestrian center would represent an agricultural use and would not be counted as a loss of farmland." Does the County consider equestrian centers true agricultural uses?

17 We can accept the mitigation of the permanent loss of 110 acres of prime agricultural land by planting vineyards over 110 acres.

<u>Issue #7 Riparian Corridor Impacts Should be Reduced</u>

18 Page 27 of Draft EIR states that short reaches of tributary drainages would be rerouted or piped to accomodate fairway layout and along the West branch of the Llagas Creek, two locations where small meanders would be removed. Why is this necessary? What options were studied to reduce the number of stream crossings?

19 On page 49 of the DEIR, the clubhouse parking area is proposed for a minimum of 75 feet from the creek bank and in some instances the edge of the turf is proposed as close as 25 feet. Setbacks of as small as 10 feet are being proposed to protect habitat values. This is too narrow. We also are
page 3

13. The open space area would be held under the ownership of the homeowners association. As required in the 1995 County General Plan, the project would include the dedication of an easement to the County over the permanent open space area.

14. Safe routes to school are an important aspect of a community; however, in this case the potential for impacts are extremely minor. First, there are no public schools close to the project site. Secondly, the project trip generation during the hour before school starts (a.m. peak hour) is relatively light with only 57 trips total on all local streets.

It is estimated that this project would add approximately 1,050 daily trips to the local streets. It is reasonable to assume that the annual trip generation would be 365 times this amount, or 383,250 trips.

The traffic study focuses on the peak commute hours because these two hours of the day typically carry more traffic than the other 22 hours. This approach is also consistent with the Santa Clara County Congestion Management Agency Guidelines for Traffic Impact Analyses. Since only moderate delays were shown for peak hour traffic conditions, evening and weekend traffic would operate with relatively light volumes and delays.

The traffic added by the occasional larger event at the project site (e.g., banquets, tournaments, weddings) may attract up to several hundred participants. The busiest traffic period for these events typically is immediately following their conclusion. However, no significant impacts are expected because of the relatively low background volumes. For example, the maximum sized event that could be accommodated at the proposed banquet facility is 200 guests, who would arrive in about 100 cars. If all these guests left in the same hour, the traffic generated would be about the same as p.m. peak hour trip generation. However, the impact would be lower than the p.m. peak (which would experience no significant impact), due to the lower background traffic levels during such events, which would tend to occur on weekends.

15. The agricultural feasibility report prepared by Dr. Niles was unclear with respect to a key element of the analysis. That is, although the family farm scenarios assumed no land costs and reduced property taxes under the Williamson Act, the cost of starting up a new farming operation was factored into the cost analysis (this latter information was not clearly explained). These start-up costs, which include land preparation, the cost of walnut trees, and the cost of planting, were factored-in to make these scenarios somewhat realistic. In the San Joaquin Valley example, there are no such start-up costs to be paid off, and therefore that operation is economically viable while the project case would not be. By the same token, Dr. Niles study was not meant to imply that existing agricultural operations in Santa Clara County are not economically viable, particularly since most of these operations are probably not carrying debt for start-up costs.

The EIR has been revised to eliminate the reference (at pages ii and 67) of economic non-viability as mitigating the impact of the loss of prime farmland. (See Section *V. TEXT AMENDMENTS.)* However, it is valid to state that the lack of economic feasibility of agricultural production on this site moderates the severity of the agricultural impact of this project.

16. The HS zoning regulations permit agricultural uses including large animal husbandry, provided that the number of animals shall not exceed one animal per two acres. Since the lot upon which

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the equestrian center would be located would comprise the 1,265-acre permanent open space area, it is the County's position that the above intensity requirement would be easily met for the 20 to 30 horses proposed. It should also be noted that although the zoning ordinance would permit keeping of one horse on each such lot (which would be two acres or larger in size). The CC&Rs for the project would prohibit the keeping of horses on the homesites themselves. Instead, the residents would keep their horses at the equestrian center, which would be available only to residents of the Lion's Gate Reserve. Keeping the horses in one location at the equestrian center would be far superior environmentally because of the stable management, manure management and drainage control measures that would be implemented, which would not be required for keeping of horses on individual residential lots.

17. Comment noted. No response required.

18. The minor alterations to the on-site drainages are included in the golf course design to improve the layout and playability of the course. With respect to the meanders, there are actually no plans to remove the existing oxbow and meander from the main creek channel. The DEIR erroneously stated that the meanders would be removed, a conclusion which was based on a review of the overall golf course plan. However, the more detailed grading and drainage plans do not show grading or vegetation removal in the vicinity of these meanders. The golf course designer, Robert Trent Jones II, confirmed that these meanders would not be removed, and that they were simply omitted from the more general overall site plan. The EIR has been revised to incorporate this corrected information. (See Section *V. TEXT AMENDMENTS.*)

    With respect to stream crossings, the applicant has revised the development plan to eliminate 5 golf cart bridges, leaving 8 cart bridges and 3 roadway crossings. (See revised Figures 9b and 10a in Section *V. TEXT AMENDMENTS.*) Since the main creek channel runs through the center of the golf course, the planned number of crossings is not excessive considering the one-mile reach of creek channel involved.

19. The setbacks were recommended by H.T. Harvey and Associates, ecological consultants for the DEIR, who believe these distances are adequate for the various conditions noted, considering the degraded state of the riparian habitat.

20 concerned at the statement on page 128, "In areas that do not support canopy for a distance of at least 100 feet, the buffer should measure 10 feet from the top of the bank." This seems to imply that any existing canopy under 100 feet could be encroached upon by development up to 10 feet from the bank. This is not acceptable.

21 We also request that the Final EIR provide very specific drawings to show the width of the buffer zones and other changes proposed to waterways.

<u>Issue #8 Cumulative Impact Analysis</u>

22 We disagree with the third paragraph on page 212 which states that the "character of this area is essentially a mixture of urban and rural uses. Therefore, these projects do not represent a fundamental change in the character of the area, individually or collectively, but are incremental additions to the ongoing gradual shift from a rural to a more urban character".

23 A review of the County General Plan indicates that, although San Martin will continue some additional rural residential growth, the area around Hayes Valley will not be shifting from a rural to a more urban character. San Martin residents, backed by County policies, will continue to support efforts to keep San Martin a rural community. Hayes Valley and its immediate surroundings is very definitely a rural area and should stay that way if the County General Plan is complied with

<u>Issue #9 Alternatives to the Proposed Project</u>

24 We believe the DEIR underestimates the reduction of impacts of the "Lower Density Alternative" described on page 219. By reducing the overall scale of the ancillary uses, particularly by eliminating the overnight accomodations and the size of the clubhouse facility, the project would be closer to compliance with the General Plan's "low-intensity" recreational use policies and would be more in keeping with the rural setting.

25 Furthermore, we would like to EIR, on page 225 under "Growth Induced by Increased Infrastructure Capacities" to reflect that the wastewater treatment and disposal and water pipes would be sized for the ultimate size of the development, including a reduced scale project and to offer some means to assure that the size of the treatment plant would not be increased in the future.

<u>Issue #10: Inaccurate Portrayal of Hayes Valley as "Low Priority" Open Space Preservation Site</u>

26 Page 71 incorrectly states that the Hayes Valley site was identified as a low priority (rated #26 out of 42) for open space preservation. Actually, the Preservation 2020 report studied a total of 61 areas for open space preservation and only listed 42 out of those as having priority. Thus, out of all of the the study areas, Hayes Valley ranked among the top half (out of 61), which does not make it a "low" priority.

We look forward to your responses to our comments as well as a bona fide visual analysis of the development. Thank you.

Sincerely,

Vicki Moore

Vicki Moore
Associate Policy Director

20. For greater clarity, the referenced statement has been revised as follows: "In areas where canopy is absent for a distance of at least 100 feet..." (See Section *V. TEXT AMENDMENTS.*)

21. The buffer zones can be seen in Figure 15, the Riparian Habitat Restoration and Enhancement Concept, as revised. (See Section *V. TEXT AMENDMENTS.)*

22. It is important to note that the cumulative impact analysis referenced in the comment considered approved or pending projects in San Martin and Morgan Hill, which has its southern City limits approximately one mile north of the project site. This is the "area" within which the project could contribute incrementally to cumulative impacts. This area currently includes urban (or suburban) and rural uses, and the overall trend within this area, which is dominated by trends in Morgan Hill, is toward urbanization. However, within the immediate area of the project, it is more accurate to characterize the trend as being a gradual shift from rural agricultural undeveloped land use to developed rural residential land use. This trend has been institutionalized in the San Martin Planning Area policies of the General Plan, which designates most of the area in the project vicinity for Rural Resident development. The EIR has been revised to add this more specific discussion for the immediate project area. (See Section *V. TEXT AMENDMENTS.*)

23. As noted in Response #21 above, the area in the immediate vicinity of the project will continue to undergo a transition from rural agricultural undeveloped land use to developed rural residential land use, in conformance with the County General Plan.

24. As discussed in Responses #1 and #7 above, the clubhouse and overnight accommodations element of the project already comprises a very small proportion of the overall development area. The total area covered by these facilities and the parking areas comprises 1.1 percent of the total golf course area, 0.7 percent of the total development area, and 0.17 percent of the entire site area. Since this already represents a very low intensity of development, the analysis of a lower intensity development would show a negligible difference in environmental effect.

25. The referenced discussion on page 225 contains essentially the same statement as the one requested, as follows: "The wastewater treatment and disposal system proposed for the project would not have any excess capacity beyond what is needed for the project." Since all development rights on the project site would be taken by the project, it is difficult to envision off-site locations for which extension of sewer service would be desirable or practical given the distances from the treatment plant and the low density of Rural Residential development allowed in the vicinity under the General Plan. Even if a treatment plant expansion were to be proposed, the operating permits from the County Department of Environmental Health and the Regional Board would require modification, and the required expansion of the Community Services District would require the approval of LAFCO.

As a practical matter it would be difficult to expand the treatment system once it is installed. All of the components of the package wastewater treatment facility would be sized to serve only the Lion's Gate project. That is, the treatment capacity would be limited to 30,000 gallons per day, which represents the peak daily flows from the project as proposed. It would be very difficult if not impossible to add to the system at a later date to accommodate additional development. The proposed treatment plant site is in a constrained location with very limited area available for expansion. Additionally, it is not possible to expand the effluent disposal pond given its location on top of a knoll, and there are no suitable locations for additional ponds nearby. Also, new

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pipeline would have to be laid and pump stations added. Moreover, it is unclear what the incentive would be to the homeowners association and the country club for tolerating the inconvenience and nuisance of a system expansion that would not benefit them.

26. The Open Space Preservation report covers a total of 61 study areas, but not all of these study areas contain open space areas targeted for preservation, of which there are only 42. A ranking of 26 out of 42 places Hayes Valley site in the mid-range of priority for open space acquisition. The EIR has been revised to incorporate this new language. (See Section *V. TEXT AMENDMENTS.)*

O

Santa Clara Valley Audubon Society

1926 - 1996

Celebrating 70 Years

Friday, April 3

Juanell Waldo
Santa Clara County Planning Department
70 West Hedding, 7th Floor
San Jose, CA 95110

Dear Ms. Waldo:

The following are comments by the Santa Clara Valley Audubon Society (SCVAS) on the Lion's Gate Reserve EIR. SCVAS has approximately 4000 members in the County, including many in the south County area. We have been involved in the numerous golf course development proposals around the County, and I also represent one of the environmental constituencies currently reviewing the County's golf course guidelines. These comments are simply listed for convenience.

Alternatives

An alternative should be studied which would allow residential and perhaps agricultural development to proceed while assuming that the CUP for
1 the golf course is denied. This would essentially reflect what the property owner could do "by right" under the current zoning. The "No General Plan Amendment" alternative does not suffice, in that it still assumes a CUP for a golf course is granted.

This would allow the County Board to accurately weigh the impacts of the proposed golf course to the impacts of residential development. In terms of water consumption, land altered, cutting and filling required, and several other measures of potential environmental impact, a purely residential development would doubtless show greatly reduced potential impacts.

This same concept was discussed in the Boulder Ridge proposal. The County should have drawn on the comments produced in those hearings to shape the alternatives for this project.

22221 McClellan Road, Cupertino, CA95014 Phone 408 • 252 • 3747 Fax 408 • 252 • 2850

O. Response to Santa Clara County Audubon Society

1. Comment noted. The EIR has been revised to include an analysis of the requested alternative. (See Section *V. TEXT AMENDMENTS.*)

Riparian Issues

While the EIR states, "Impacts to the riparian habitat would be avoided to
2 the extent feasible," the project as proposed does not achieve this goal.
Instead, the project relies on mitigation to compensate for losses to riparian values.

The project would generate at least 15 roadway or cartpath crossings of the West Branch Llagas and its tributaries. Two of these would be at least 62'
3 wide, while the others would be smaller. Combined, the result will be a major fracturing of the riparian corridor in the area.

Continuity of riparian habitat is important to many species. A discussion of the continuity of habitat currently, under the project as proposed, and under the project with changes (see below) should be included in the EIR, with those impacts better quantified.

In addition, the EIR should contain more information about nesting and
4 breeding of birds and other wildlife on the site. Now would be the right time of year to be looking for nests and fledglings. Many bird species nest primarily in less disturbed areas of habitat, especially areas of more dense canopy cover and little human intrusion. This project will disturb much of what little dense canopy cover exists near the West Branch Llagas, and nearly all the better quality riparian habitat would be subjected to human disturbance.

Several changes to the project should be considered to avoid these impacts and enhance the riparian zone.

5 -First, the layout of the course in particular and the development in general should be altered to reduce the number of creek crossings.

-Second, setbacks of the course from the riparian areas should be increased. No doubt, the course will intrude on the creek, but these places
6 should be carefully planned. Currently, holes 2, 6, 7, 8, and 9 all play immediately adjacent to the main creek, and other holes play adjacent to tributaries. A setback goal should be made, and then areas that infringe on that setback should be compensated for by other areas with increased setbacks.
7 Further, the holes should be designed so that poor players will not often be hitting balls into the creek, then ignoring the signs and walking into the creek area. Setbacks and holes that play away from the creek would help solve this.

-Third, some areas of dense, undisturbed habitat should be created to
8 accommodate nesting and foraging of species more sensitive to human intrusion (such areas are sometimes called "refugia").

-Finally, the project proposes to remove two meanders from the main creek. This impact should be avoided. Meanders are natural to most creek

2. As noted in the DEIR, the riparian areas along West Branch Llagas Creek have been severely degraded by cattle grazing over the years. There are few mature riparian trees and no understory. The plant species present along the creek are those typically found in the adjacent non-native annual grasslands. Consequently the habitat value of the creekside area is very low compared to pristine riparian corridors. A recent reassessment of riparian vegetation based on detailed field measurements found that 0.83 acres of riparian vegetation would be removed. In addition, the existing degraded habitat along West Branch Llagas Creek would be restored at a ratio of 3:1 and enhanced through a comprehensive planting program, as discussed in the DEIR.

3. Subsequent to the release of the DEIR, the applicant revised the golf course plan to eliminate 5 golf cart bridges, leaving 8 cart bridges and 2 roadway bridges in the plan. (See Section *V. TEXT AMENDMENTS.*) All of the proposed bridges would span the creek channel without placing piers or abutment walls in the channel itself. Sufficient room would remain under the bridges to allow for wildlife passage. As noted on page 128 of the DEIR, the turfed areas adjacent to the riparian corridor are used by wildlife, and thus would not inhibit wildlife movement along the creek. Thus the function of the riparian zone as a movement corridor would not be interrupted by the bridge crossings.

4. As discussed in the DEIR and the supporting biological reports in Appendix F, the project site was subject to extensive field surveys for a number of wildlife species. Those surveys were primarily focused on species of special concern such as the golden eagle, burrowing owl and other raptors, the San Joaquin kit fox, herptiles such as the California tiger salamander, the western pond turtle and red-legged frog, and invertebrates such as the Bay checkerspot butterfly and Opler's longhorn moth. All of these surveys were conducted at the appropriate time of year for each species. In addition, pre-construction surveys would be required during the breeding season for the bird species to ensure that no new nests have been established that may be subject to project impacts, with avoidance required if such new nests are found.

5. As noted in Response #3 above, 5 of the 13 cart crossings originally proposed have been removed from the golf course plan.

6. As discussed on pages 127-8 of the DEIR, the golf course plan conforms with setback requirements for varying environmental conditions, as established by H.T. Harvey and Associates, a well-qualified ecological consulting firm.

7. Two of the 18 holes cross the creek channel. In both instances tee boxes are planned on the opposite side to provide the option of not playing across the creek, and signs would be placed prohibiting golfers from entering the creek. Golfers who lose their ball in riparian habitat would not be assessed a penalty stroke for continuing with a new ball, thus further reducing the tendency for unauthorized incursions. No tree or shrub planting is proposed at the points where the two holes across the creek channel (and where the current habitat value is minimal), so occasional unauthorized incursion by golfers into these areas would not result in significant impacts. In addition, information would be distributed to golfers regarding the value of the riparian corridor and the importance of not entering it

8. In addition to the areas of riparian habitat enhancement along the creek channel, the project includes the preservation of 460 acres of valley oak woodland and over 500 acres of non-native grassland, including all of the on-site serpentine grasslands. In addition, new habitat areas would be created for the California tiger salamander and the western pond turtle.

9 systems and serve important hydrodynamic processes. Removing meanders often leads to increased up or downstream erosion, necessitating future erosion control measures.

Is This "Low Intensity," Rural Development

The EIR seems to state that because each of the individual uses (golf course, large clubhouse, overnight accommodations, conference rooms, swim
10 and tennis club, equestrian center, restaurant, residential housing, vineyards) of the site could be consider "low intensity, low density," then the project as a whole complies with County General Plan policies. This is false logic. The EIR should discuss whether the conglomeration of many "low intensity" uses makes this a high intensity project, and which of the various uses should be sacrificed to bring down the level of overall intensity.

Misc.

The project should consider using decomposed granite or another
11 permeable surface for the golf cart paths. Such surfaces are evidently functional on lesser slopes such as these and would decrease the amount of impervious surface.

Why does the swim and tennis center need its own clubhouse? The layout
12 of this facility should allow for use of the main clubhouse, which will have much the same facilities.

The project plans introduction of mosquito fish to the site. There should
13 be assurances that the fish can not move off site or to on site creeks, as they interfere with native species.

Lakes and ponds on the site should, where possible, be vegetated with
14 natives. Many courses put turf grass to the edge of their lakes and erect walls or hardscape borders around them. Visual and habitat considerations benefit from more natural looking waters.

Thank you for considering these concerns.

Sincerely,

Craig K. Breon

Craig K. Breon

9. There are no plans to remove a meander and an oxbow from the main creek channel, as indicated in the DEIR. The EIR erroneously reported that the meanders would be removed, a conclusion which was based on a review of the overall golf course plan. However, the more detailed grading and drainage plans do not show grading or vegetation removal in the vicinity of these meanders. The golf course designer, Robert Trent Jones II, confirmed that these meanders would not be removed, and that they simply were omitted from the more general overall site plan. The EIR has been revised to incorporate this corrected information. (See Section *V. TEXT AMENDMENTS.*)

10. Although the proposed development area (including the 263-acre golf course area) encompasses a 410-acre area of the site, the actual coverage of this area is quite small and cannot be considered as anything but low-intensity. The Floor Area Ratio (FAR) of the golf course component is less than 1 percent, compared with typical suburban FARs of 40 to 60 percent for industrial park or commercial retail developments. The FAR of the residential component is approximately 3 percent, compared with 30 to 40 percent for a typical suburban tract subdivision. The impervious surface coverage by the golf course and residential components, including all structures, roads, parking areas, driveways and cart paths, is 6 percent over the 410-acre development area and 1.5 percent over the entire site area. Compared with 40 to 50 percent for industrial park or commercial retail development, these coverages reflect a very low intensity of land use. Applying traffic generation as a measure of land use intensity, the total project would generate approximately 1.5 trips per minute during the p.m. peak hour, which is an extremely low rate compared to typical suburban development. These figures indicate that the proposed project is indeed low-intensity in nature.

11. Comment noted. No response required.

12. The swim and tennis center requires a building to house showers, change rooms, rest rooms, lockers and the like. It does not make sense to have swimmers driving to the main clubhouse to change out of their wet swimsuits.

13. Mosquito fish would only be used in ponds that are self-contained, such as the reclaimed water storage pond and the irrigation storage pond.

14. As noted in the EIR, the existing pond would be maintained as a wetland, and the new ponds to be created to provide habitat for the tiger salamander and western pond turtle would also include native wetland vegetation.

P

SIERRA CLUB • LOMA PRIETA CHAPTER

San Mateo • Santa Clara • San Benito Counties

May 2, 1996

Juanell Waldo
Santa Clara County Office of Advance Planning
County Government Center, East Wing
70 West Hedding Street
San Jose CA 95110

RE: Comments on DEIR for Lion's Gate Reserve (Hayes Valley) Golf Course

Dear Juanell:

The Loma Prieta Chapter has the following concerns regarding the project as proposed and request that these be addressed in the FEIR. Our concerns range from a general concern that the project is too intensive a development for the rural area to specific requests for clarification.

In general, we believe that the level of development proposed is too intensive for the rural nature of the area. We believe that the precedent set by the package sewage treatment plant and the size and intensity of ancillary uses for both the golf course and the residential development will set the tone for development in the south county for decades. The precedent of this project is even noted in the DEIR. Such a precedent deserves a thorough and deliberate review by the Planning Commissioners. Specifics of these concerns are detailed below.

1 **Massive Building Development** The total mass of buildings proposed for the site, not including residential, is in excess of 85,000 square feet. This is disproportionate to existing and proposed development in the area. The proposed square footage of development includes a club house of 29,000 square feet, proposed cottages/meeting rooms in excess of 25,000 square feet, a maintenance facility of 6,000 square feet, a 1,000 square foot facility to serve the practice facility, a club house at the swim and fitness center of 2,000 square feet, the sewage treatment plant is (I can't even find how many square ft. it is) and the equestrian center which would have numerous buildings, including a 100'x200' foot covered arena + 20 to 30 stalls on three sides (20,000+ square ft), hay storage and a caretaker's residence. This level of development is quite substantial and deserves careful scrutiny.

3921 East Bayshore Road Suite 204
Palo Alto, CA 94303
415-390-8411
FAX 415-390-8497

P. Response to Sierra Club - Loma Prieta Chapter

1. The project cannot be characterized as a "massive building development" by any measure. The Floor Area Ratio (ratio of total floor area to total site area) or FAR of the golf course component is less than 1 percent of the golf course site, compared with typical suburban FARs of 40 to 60 percent for industrial park or commercial retail developments. The FAR of the residential component is approximately 3 percent, compared with 30 to 40 percent for a typical suburban tract subdivision. The impervious surface coverage by the golf course and residential component, including all structures, roads, parking areas, driveways and cart paths, is 6 percent over the development area and 1.5 percent over the entire project area. Compared with 40 to 50 percent for suburban residential subdivision and 80 to 95 percent for industrial park or commercial retail development, these coverages reflect a very low intensity of land use.

   The residential densities proposed are comparable to existing and planned Rural Residential densities in San Martin. In the HS zone, the density is one lot per 36 acres, with proposed dwellings clustered on 2-acre minimum lots as permitted in the HS zone. In the RR zone, the density is one lot per 5 acres, with 2-acre minimum cluster lots as permitted in the RR zone. This is consistent with the prevailing and planned Rural Residential densities in the San Martin planning area.

Overnight Accommodations As written now, the units are only for the guests using the golf course or guests of corporate members. What is the justification for 45 units?
2 Has there been a market study? Is there a reasonable guarantee that this number and approach is economically feasible and the accommodations won't need to be opened up to the public or marketed quite aggressively? Will the limitation on guests be a condition of permit and what approvals will the applicant need to change the limited nature of the guest list?

We believe that the analyses of the lower density alternative is incomplete as it only
3 analyzed a project with fewer residential units. We request additional review of the benefits of fewer or no overnight accommodations. If there were no overnight accommodations the development would have less of a commercial feel to it.

4 We understand that the mitigation for the growth inducement or commercialization of the overnight accommodations is limiting access to foot or golf cart only. However, the drawings in the DEIR do not adequately show if the design precludes this from changing in the future. Will the conditions of permit require limited access? If, in the future, cars were allowed to drive to the units, would the applicant need to revise the permit or go through some approval process?

Page 18 indicates that the guest cottages may also have some meeting rooms. Exactly
5 how many rooms are proposed? How many meetings annually are predicted? Will Lion's Gate also become a meeting facility? Does this activity require a conditional use permit?

6 Also please specify the total square footage for buildings which will house the rooms (guest + meeting). This was not clear in the DEIR.

Package Sewage Treatment Plant A package sewage treatment plan certainly has
7 some benefits (less potential for increases in nitrate contamination, ability to reclaim the water). As we understand it, each residential development must be able to meet septic requirements. Can the other facilities, clubhouse, guest cottages, swim and tennis center and practice service facility also meet septic system requirements? Where would the leach fields be and was their impact analyzed? What precedent does this set for other
8 medium to high intensity commercial uses in areas zoned hillside? Since, a community service district is needed for the management of such a plant, will this increase the likelihood that we will see more mixed use developments in the future?

9 Since the boundary for the new community services district is set up by LAFCO after the permit is approved, what is to keep the boundary from including more houses or businesses? In other words, what guarantee do we have that this plant will not be growth inducing? Just because the winter storage pond only accommodates the size of this project, what precludes the district from building a second pond?

2. The 45-unit figure is the lowest number considered to be economically feasible by Benchmark Hospitality, the firm that will operate the overnight accommodations. Benchmark operates numerous facilities, including the Squaw Creek Resort at Lake Tahoe and Chaminade in Santa Cruz County. Based on their experience, Benchmark believes a higher number of units could be supported at the site. In fact, the original proposal was for 60 units, which was scaled back to 45 units when the 9-hole academy course was eliminated from the plan.

3. The 45-units of single-story overnight accommodations would comprise approximately 34,000 square feet of floor area. This represents 0.3 percent of the total golf course area, 0.2 percent of the total development area, and 0.05 percent of the total project site area. Since this already represents a very low intensity of development, the analysis of a even lower intensity development would show a negligible difference in environmental effect, and therefore is not justified. Moreover, a complex with fewer units would not be economically feasible according to Benchmark Hospitality, the operator for the overnight complex, as discussed in Response #2 above. It is also important to note that the overnight units would be distinctly residential in appearance, and would not have a "commercial feel." Also, the overnight units would not be visible to the public from off-site locations.

4. As shown in the detailed site plan for the clubhouse vicinity (Figure 10a of the DEIR), the cart paths providing access to the overnight units are 10 feet wide, with sharp curves, and have the units clustered closely along the path. With this layout, it would be impossible to convert these paths into vehicle access drives that would meet County standards. Thus the possibility of future vehicular access is precluded in the site plan itself. Any future proposal to change the site plan would require an application for a use permit modification which would require a Planning Commission hearing. Any thoughts of converting these units to residential would be futile since a General Plan Amendment would be required, and the General Plan contains no residential categories that could be used for such a conversion.

5. There would be one meeting room for every 2 units, or no more than 23 meeting rooms. These meeting rooms would be quite small at 500 square feet, and would accommodate meetings of only a few people. It is unknown how many meetings would be held here. It should be noted that the primary attraction in staying here would be the golf course, so any meetings would be incidental to playing golf. The overnight accommodations, including the meeting rooms, would be included in the conditional use permit for the entire golf course facility.

6. The floor area of each of the 45 overnight units would approximately be 500 square feet for all of the units. Each of the 23 meeting rooms would also be approximately 500 square. Thus the total floor area of the overnight accommodations would be approximately 34,000 square feet.

7. The septic requirements for the golf course and related facilities could be met on the site with leachfields, although both the County Department of Environmental Health and the Central Coast Regional Water Quality Control Board have indicated that a package treatment plant would be much preferable from a water quality standpoint.

8. This would be the first package treatment plant to be built in the County. (Although a package treatment plant was previously approved for the Gilroy Hot Springs project, that development has been since downscaled and will now utilize leachfields.) However, it is not the first instance of a CSD formed in the County to operate and maintain a community wastewater treatment system. (The Lake Canyon area in the Lexington Basin has a CSD to administer the community

How large will the actual treatment plant be? While we find its location on the maps, we
10 are unable to find a discussion on its size, bulk, or visual impact. Please provide this
information.

11 What are the "fast growing trees" which are proposed to be used to screen the holding
pond?

Equestrian Center This is a large equestrian center, that may seem more like a
12 commercial operation than agriculture to many, and it is in the area designated as
"permanent open space." Is the size of buildings and level of activity consistent with the
agricultural uses allowed under the policy? Is the caretaker's residence allowed under
the policy? Will the operations need a conditional use permit or be included in the
cluster development permit? Will there be a condition of permit precluding lessons,
13 rentals or boarding of horses, aside from boarding horses of those who live in the 41
houses? This is a pretty fancy facility for 41 homes, will operations need to be expanded
to pay for the facility? Why are 20 parking spaces required for a facility which will serve
14 only the residential development? Will the storage of horse trailers be provided on this
site? Where?

Please specify the proposed square footage of all buildings associated with the
15 equestrian facility.

16 Please evaluate a smaller equestrian facility under the lower density alternative.

17 The manure should be composted on site. Disposal in a landfill is inconsistent with state
goals to divert solid waste from the waste stream. The DEIR should include a review to
determine where and how a compost facility can meet appropriate permit requirements.
We further urge that any composting facility be designed to support a process which
reduces the viability of weed seeds.

18 The discussion in appendix D, page 7 states "Because of the limited impervious surfaces
associated with the equestrian center, there should be no increase in runoff from the area
after the project." Has the runoff from roofs of all of the buildings (100'x200' foot covered
arena +20 to 30 stalls on three sides, hay storage and a caretaker's residence, etc.) been
factored into that equation? The paragraph further states that the detention pond, while
retaining water from a small storm event may not affect flooding from storms greater
19 than 10 years. The EIR does not clearly indicate the impact or mitigations for flooding
from this facility. Further, would the flood water which discharges into a "ditch along
the road" be contaminated or be a health risk?

20 **Swim and Tennis Center** The narrative indicates that the corporate members of the golf
course will also be allowed to use the swim and tennis center, including the 2,000 square
foot clubhouse. Is this allowed on the lands designated for "permanent open space?"

wastewater collection and leachfield system.) It cannot be predicted whether similar projects with CSDs would be proposed in the future.

9. Any boundary adjustment for the CSD would require LAFCO approval, which would have to be tied to a discretionary approval by the County for any new project to be included in the CSD. At the time that the boundaries of the CSD are set, LAFCO would also establish a Sphere of Influence for the CSD. Since the objective would be to prevent future expansion of the CSD, the Sphere of Influence boundaries would be made coterminous with the CSD boundary. Any request from property owners outside the CSD for a boundary expansion or annexation to the CSD would require a showing of compliance with the policies governing such annexations, as well as the policies governing expansions of Spheres of Influence. The governing board of the CSD would almost certainly oppose any such annexation request, which would have significant influence on LAFCO's decision regarding such requests.

   As a practical matter, it would be difficult to expand the treatment system once it is installed. All of the components of the package wastewater treatment facility would be sized to serve only the Lion's Gate project. That is, the treatment capacity would be limited to 30,000 gallons per day, which represents the peak daily flows from the project as proposed. It would be very difficult if not impossible to add to the system at a later date to accommodate additional development. The proposed treatment plant site is in a constrained location with very limited area available for expansion. Additionally, it would not be possible to expand the effluent disposal pond given its location on top a knoll, and there are no suitable locations for additional ponds nearby. Also, new pipeline would have to be laid and pump stations added. Moreover, it is unclear what the incentive would be to the homeowners association and the county club for tolerating the inconvenience and nuisance of a system expansion that would not benefit them.

10. The floor area of the wastewater treatment plant would be 2,000 square feet. It would appear as a single-story structure and would be unobtrusive and designed to be compatible with the other on-site structures.

11. Since the holding pond would be elevated relative to the rest of the project, it would only be visible from the single residence on the adjacent ridge to the north, and the future trail along the northern site boundary, which would be 2,800 feet and 1,400 feet from the pond, respectively. Specific landscape species would be identified in conjunction with the Landscape Plan to be approved at ASA.

12. The proposed equestrian center, which would have room for 20 to 30 horses, cannot be characterized as large or commercial in scale. A large equestrian center would be typified by the existing Calero stables at Calero Reservoir, or the proposed equestrian center at the Guadalupe landfill in San Jose, both of which have capacity for 150 horses. Caretakers residences are permitted in the HS Zoning District. It should be noted that the equestrian center is proposed instead of allowing horses to be kept on each lot, as permitted in the HS zone. In the absence of an equestrian center, there would be no manure management plan or drainage control to mitigate the effects of horse stables. The equestrian center would be a private facility for the use of residents only, and would not be a commercial operation.

13. The conditions for the equestrian center would be included in the cluster development permit, since it would be a permitted recreational use within the permanent open space area for the Hillside cluster subdivision. The conditions of the permit would specifically preclude the possibility of expanding the operation to a commercial facility.

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14. The parking layout for the equestrian center would be refined during the ASA process, and would be designed in compliance with the County parking standards.

15. The equestrian center would comprise an enclosed riding area (20,000 square feet), stables (12,000 square feet), caretaker's quarters (1,800 square feet), reception hall (5,000 square feet), and office and display room (3,200 square feet), for a total of 42,000 square feet. A new figure showing the floor plan and building elevations of the equestrian center has been added to the EIR as Figure 10c. (See Section *V. TEXT AMENDMENTS.*)

16. The proposed equestrian facility cannot be characterized as large, compared with other facilities in the area, as discussed in Response #12 above. A smaller equestrian facility would result in a negligible difference in terms of impacts, and fewer impacts than would result from horse stables on each residential lot, as discussed in Response #12 above.

17. It has not yet been determined whether the manure from the equestrian center would be composted or disposed of at an approved landfill. This would be determined in conjunction with the preparation of a Manure Management Plan which would be prepared for ASA.

18. It is important to note that runoff that currently flows through the equestrian center site from the adjacent hills to the west would be diverted around the area and into the large lake, which would compensate for the minor addition of runoff from the new impervious surfaces.

19. As discussed in the DEIR, the paddock and exercise areas would be cleaned of manure daily. The retention pond would dry up in summer when it would be cleaned of accumulated sediments. Given the high maintenance of the equestrian facility, the condition of the runoff stored in the pond would be similar to runoff currently generated on the site or other pastures in the area. During a heavy storm, this runoff would be further diluted and would not pose any greater health risk than flood waters from other agricultural areas. The pond would be sized to contain runoff from a 25-year storm, but would overflow some of its contents in larger storm events. However, since the equestrian facility and the retention basin would be sited outside the 100-year floodplain, they would not be subject to inundation during the 100-year event or lesser frequency events.

20. The swim and tennis center lie within the area of the golf course, and are not located within the area to be preserved as "permanent open space."

Clubhouse Activities What is meant by "card rooms" in the description on page 20
21 of what will be included in the clubhouse? What frequency and range in size of events
22 was assumed to determine number of employee and traffic generation?

23 **Practice Facilities** Where is the 1,000 square foot structure which will serve the
practice facility located? It does not seem to be on any map. Is this square footage
24 included in the total shown for the other buildings on Table 2?

25 **Night Operations** What night activities are anticipated? If yes, what is the impact of
26 the lighting? Will the hours of operation be addressed in the use permit?

27 **Table 1** Does Table 1 include the area and access road for the maintenance facility?

Table 2 Please expand Table 2 to include information related to the size of the
28 package treatment plant, the number of lakes or detention ponds, the equestrian center,
swim and tennis center, practice facility building, and meeting rooms.

29 **Maintenance Facility** The discussion on pg. 98 indicates that all drainage from
adjacent paved areas will drain into an advanced filtering and recycling system. Does
this include all of the drainage from the maintenance facility, especially from the 20,000
square foot area of impervious surface for parking, wash down and storage? Or does
only the wash bay at the rear of the facility drain into this facility? If it all does not go
into the filtering/recycling system, to where does the excess drainage flow?

30 **Stream Crossings and Riparian Buffer Zones** We are very concerned about the
number of stream crossings required by this project and that the project did not review
31 alternative designs. What options are there for reducing stream crossings? What
options exist for retaining the meanders and not piping the reach near the parking?

While we understand that the County's General Plan allows for reduced buffer zones in
32 stream reaches where the habitat is degraded, we are still confused by the meaning of
the sentence on page 128, "In areas that do not support canopy for a distance of at least
100 feet, the buffer should measure 10 feet from the top of the bank." Does this mean if
there is an existing canopy of 50 feet, that the development can encroach 40 feet into the
buffer zone?

Specific information with respect to the width of buffer zones and the various crossings
33 is very hard to discern from the document's graphics. Please provide graphics which
more clearly indicate the buffer zones and other changes proposed to waterways.

34 **Wildlife** What is the position of the resource agencies with respect the development
and mitigation proposals? Are the mitigation ratios and monitoring plans acceptable?

35 We recommend that a prohibition on the use of mosquitofish be added to the mitigations
for the tiger salamander.

21. According to the applicant, the members lounge would include rooms with tables for casual card games.

22. The traffic study focuses on the peak commute hours because these two hours of the day typically carry more traffic than the other 22 hours. This approach is also consistent with the Santa Clara County Congestion Management Agency Guidelines for Traffic Impact Analyses. Since only moderate delays were shown for peak hour traffic conditions, evening and weekend traffic would operate with relatively light volumes and delays.

    The traffic added by the occasional larger event at the project site (e.g., banquets, tournaments, weddings) may attract up to several hundred participants. The busiest traffic period for these events typically is immediately following their conclusion. However, no significant impacts are expected because of the relatively low ambient volumes. For example, the maximum sized event that could be accommodated at the proposed banquet facility is 200 guests, who would arrive in about 100 cars. If all these guests left in the same hour, the traffic generated would be about the same as p.m. peak trip generation. However, the impact would be lower than the p.m. peak (which would experience no significant impact), due to lower background traffic levels during such events, which would tend to occur on weekends.

23. The 1,000 square-foot driving range building would be located near the driving range tee boxes. Figure 10a has been revised to show the location of this structure. (See Section *V. TEXT AMENDMENTS.)*

24. The square footage for the driving range building is not included on Table 2, which is intended to provide a summary of the main project elements, not an exhaustive recounting of all of the project statistics contained in the project description narrative.

25. Activities which would occur in the evening at the clubhouse complex include operation of the restaurant, occasional weddings and banquets, and of course occupancy of the overnight accommodations. Since the clubhouse complex is not visible to the public from off-site locations, there would be no lighting impact from these activities. The swim and tennis center would also operate in the evenings. This facility is well set back from the site frontage on Turlock Avenue and would be visually screened by landscaped berms. As discussed in DEIR Section *III. J. Visual and Aesthetics*, project lighting would be designed to minimize off-site light and glare, and would be subject to ASA review.

26. There are currently no plans to limit the hours of operation for any specific project activity in the use permit, although other laws and regulations may do so.

27. Table 1 does include the area for the maintenance facility and access road within the golf course acreage.

28. Table 2 is intended to provide a summary overview of the main project elements, not an exhaustive accounting of all the project statistics contained in the project description narrative.

29. The statement on page 98 of the DEIR has been revised to indicate that washwater from the equipment washing area and drainage from the chemical mixing area would be conveyed to the water filtering and recycling system. The recycled water would be reused for equipment washdown. This washdown and chemical mixing area would be covered to prevent rainwater from entering the system. The stormwater drainage from the remaining paved areas would be

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directed to grease traps before being released to the storm drain system. (See Section *V. TEXT AMENDMENTS.)*

30. Upon further review of the golf course plan, the applicant has identified 5 crossing points that can be eliminated or combined with nearby bridge crossings. These refinements are reflected in the revised Figures 9b and 10a. (See Section *V. TEXT AMENDMENTS.)*

31. There are actually no plans to remove the existing oxbow and meander from the main creek channel. The DEIR erroneously stated that the meanders would be removed, a conclusion which was based on a review of the overall golf course plan. However, the more detailed grading and drainage plans do not show grading or vegetation removal in the vicinity of these meanders. The golf course designer, Robert Trent Jones II, confirmed that these meanders would not be removed, and that they were simply omitted from the more general overall site plan. The EIR has been revised to incorporate this corrected information. (See Section *V. TEXT AMENDMENTS.*)

32. For greater clarity, the referenced statement has been revised as follows: "In areas where canopy is absent for a distance of at least 100 feet..." (See Section *V. TEXT AMENDMENTS.)*

33. The crossings in the central area of the golf course can be clearly identified in Figure 10a (as revised). Figure 9b has also been revised to more clearly indicate the bridge crossings. Figure 15, the Riparian Habitat Restoration and Enhancement Concept, has been revised to highlight the turfed areas, so that the buffer zones along the creek can be more readily discerned. (See Section *V. TEXT AMENDMENTS.*)

34. The U.S. Fish and Wildlife Service did not comment on the DEIR. The California Department of Fish and Game expressed their concerns in a letter dated May 6, 1996, which is included as Comment Letter A. In response to that letter, several refinements were made to the development plan. A meeting with the DFG biologist Jeannine DeWald was held on the Lion's Gate site on June 24, 1996. At that field meeting, Ms DeWald indicated that her concerns had been generally satisfied with the refinements to the mitigations and the clarifications to the EIR, as discussed in the Response to Comment A in this FEIR.

35. As stated on page 200 of the DEIR, mosquito fish would only be appropriate for the effluent storage pond and the irrigation pond, which would be self-contained with no outlets. As stated, mosquito fish would not be introduced to water bodies with outlets to natural drainages, such as the existing pond and the proposed lake in the residential area.

We are assuming that this construction will occur over a period of a few years.
Mitigation for many animals include preconstruction surveys 30 days prior to site
36 development. We are unsure what "site development" means. We, therefore,
recommend that the language for "preconstruction surveys" be amended to address any
phasing of construction. We also recommend that there be at least one survey per year,
appropriate to the species' critical habitat and life cycle, during the entire construction
process.

Groundwater **Page 27 last paragraph in** <u>Drainage</u> Has the impact of discharged
37 into dry wells been analyzed? Why is it even needed as an alternative? We believe that
this option should be discarded.

38 **Page 32 first bullet** The narrative states that a minimum vertical separation of 2 feet
from high groundwater would be provided. Has the County's Agricultural Inspector
given a determination on the recommended minimum separation?

39 We applaud the applicant's intention of monitoring ground water conditions. What
bonding or contingency plans will be required in case contamination is detected?

The document states that the amount of nitrates percolating from the property will be
reduced through a combination of removing the cattle and the nitrogen uptake of the
course turfs. It also states that the contribution of nitrates from the equestrian facility
will be mitigated by directing runoff into the lined pond. Were the potential impacts
40 from using pond water for irrigation analyzed? Was the percolation of rainwater in the
open areas of the equestrian center analyzed?

It also notes that level of nitrate contamination increases from west to east, with higher
41 concentrations found east of the property. If the amount of water in the aquifer is
reduced, will the concentration of nitrates increase in the waters east of the property?

Water Supply While we have found information showing that the average water
42 use is below the safe yield, we were unable to locate the information which shows that
peak summer use won't exceed safe yields. Please provide the information which shows
that peak summer use will not impact the ground water and wells down gradient.

43 Also, the February 20, 1996 letter from Geoconsultants to Tom Hix states in the
conclusions that "...the figures are preliminary in nature. In order to assure that the
projected supplies are realistic, a detailed aquifer analyses will need to be performed at
the Lion's Gate Reserve. In addition, it may be necessary to perform further studies in
44 the West San Martin and Twin Valley areas." Have these studies been done? If not, will
they be required?

36. Grading and construction for the golf course facilities would be completed over a period of approximately 18 months. In the event that there are areas of the project where grading and construction has not commenced before the second breeding season, additional pre-construction surveys would be conducted for those areas.

37. Comment noted. The EIR has been revised to delete the reference to dry wells. (See Section *V. TEXT AMENDMENTS.*).

38. The County Agricultural Commissioner has stated that no numeric standard would be meaningful given the variability of conditions from site to site, and that this issue should be resolved on a case-by-case basis depending on site-specific conditions.

39. The contingency plan to be implemented in the event that contamination is detected is described in detail on pages 101 and 102 of the DEIR.

40. The retention pond at the equestrian center would not be used as a source of irrigation water. As discussed on page 103 of the DEIR, the equestrian area would be cleaned of manure daily, so the potential for nitrates percolating into the soil would be minimized.

41. On page 198 of the DEIR it is stated that the addition of nitrates from golf course fertilizer and wastewater disposal would be roughly equivalent to current nitrate loadings from cattle grazing. However, the estimate of project nitrate loading is conservative and would likely be less given the operating criteria of matching nitrogen applications to turf nutrient requirements. In addition, the nitrate loading analysis did not take into account the nitrogen uptake from the proposed tree planting, which can be substantial (e.g., 20 to 40 lbs per acre). However, if one assumes that there would be no change in nitrate loading on the site, the reduction in groundwater could theoretically reduce the amount of groundwater available for dilution of nitrates downgradient from the site. However, according to Questa Engineering, it is unlikely that an actual increase in nitrate levels in downgradient wells would occur as a result of reduction in groundwater flows from the site.

42. Average annual water demand includes both peak usage during the hot summer months, as well as zero usage during the periods of heavy rainfall in the winter months. The primary purpose of peak demand calculations is to assure that the entire water supply system is capable of producing the required amounts without overdrafting the aquifer. During periods of high demand, water would be taken from the on-site storage pond to prevent stress to the aquifer. In addition, supplemental supplies would be piped from the West San Martin Water Works to the on-site storage pond. The question of when to begin drawing from this supplemental source would be initially calculated based on information obtained during the site testing program. During operations, a downgradient monitoring well located on the site would be monitored constantly during peak pumping periods to observe any drawdown in the water table, which would serve as the indicator of when to suspend on-site pumping and start drawing exclusively from the supplemental sources. In addition, existing off-site wells would also be monitored to ensure that impacts are not occurring to those wells. After the system has been in operation for a period of time, the project geohydrologist would obtain a more refined knowledge of the aquifer characteristics, and would be able to more closely plan for water supply augmentations based on weather conditions and the previous winter's rainfall (or lack thereof during drought conditions).

43. There is no doubt on the part of Geoconsultants that more than sufficient water supplies are available to serve the project from on-site groundwater, in combination with supplemental

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supplies from West San Martin Water Works and Twin Valley, Inc. (The Santa Clara Valley Water District, in a memo dated June 26, 1996, has indicated it concurrence that there is sufficient water available for the project. This memo has been added to the EIR and is included in Section *VI. REVISIONS TO THE APPENDICES OF THE EIR.)* Additional studies will be required prior to construction to define the characteristics of the aquifer, for purposes determining the number of production wells(s) needed, their optimum locations, and in particular to establish setback distances for these new wells to ensure that they do not have an impact on off-site wells. There is no doubt on the part of Geoconsultants that there is sufficient area available on the site so that the required production well(s) can be placed in locations where they would not result in off-site impacts.

44. A detailed hydrogeologic analysis would be performed prior to on-site water usage. (A description of the detailed groundwater investigation is provided in Section *II. OVERVIEW OF MAIN ISSUES DISCUSSED IN COMMENTS ON DEIR, A. WATER SUPPLY.)* The best time for conducting all of these studies is in the late summer or early fall when the groundwater table has reached static conditions. Any investigations conducted earlier in the year would still be influenced by the previous winter's rainfall.

The document bases its assessment that the project will not impact the aquifer on studies
45 conducted by Rantz (1971 & 1974). These estimate the rate of runoff, recharge and water
loss to evapotranspiration. Does this assessment account for reductions in recharge due
to increase water absorption or uptake by course vegetation? Does this assessment
46 include reduction in recharge due to increased impervious surfaces and lined lakes in
the recharge area? How many acres of the recharge area are removed by the project?
What are the expected decreases in recharge because of this project? What impact will
that have on the water table and safe yield assessments?

47 **Traffic** While the analyses of the peak am and pm flows is important it may not be
the most relevant measure for this community. Please analyze the impacts during time
48 that children are going to school. Please indicate the expect daily and annual average
49 number of trips that this project would generate. Would increase traffic from night
events at the clubhouse impact the community?

50 There is no discussion in the document about contingencies for overflow parking during
tournaments or large weekend day events at the clubhouse. Please discuss this issue.

In closing, we urge a thorough review of the impacts from the ancillary use, a detailed aquifer analyses and a review of alternatives which will provide larger buffer zones for riparian areas.

In addition, we urge that the comment period on the DEIS be extended and that the Planning Commission take another tour of this project. We do understand that they did toured the site just over a year ago but we believe that they will benefit from a tour after the presentation on May 2,1996.

Thank you for the opportunity to comment on this project.

Sincerely,

Julia Bott

Julia Bott, Chapter Director

45. Annual groundwater recharge estimates presented by Geoconsultants included losses from retained surface moisture to account for vegetation.

46. The increased acreage of impervious surfaces, such as structures, roads, cart paths, and parking lots, is minute in relation to the overall project acreage (1.5 percent over the 410-acre development area, including the 263-acre golf course area). The proposed lakes would not be lined, and thus would augment recharge rather than diminish it. In addition, the retention basins to be located throughout the golf course would provide further recharge capability.

47. Safe routes to school are an important aspect of a community; however, in this case the potential for impacts are extremely minor. First, there are no public schools close to the project site. Secondly, the project generation during the hour before school starts (a.m. peak hour) is relatively light with only 57 trips total on all local streets.

48. It is estimated that this project would add approximately 1,050 daily trips to the local streets. It is reasonable to assume that the annual trip generation will be 365 times this amount, or 383,250 trips.

49. As discussed in Response #22 above, the traffic added by occasional evening events would not have a significant impact, primarily because of the low background traffic volumes.

50. For events such as weddings and banquets that may occur simultaneously with regular golf course activities, the planned parking areas may not be sufficient. Under these conditions, the available parking area would be maximized by valet parking, which would allow vehicles to be parked closely together. In the event that overflow parking would be required, it would be provided in an area to the north of the planned chipping green on the north side of the main access road, between the driving range and Lot 11 (see revised Figure 10a in Section *V. TEXT AMENDMENTS.)* In this location there is a relatively level area of sufficient size which is away from the creek and otherwise absent of environmentally sensitive features. No parking areas outside the golf course site would be required.

    Special parking arrangements such as those described above may also be required for some golf tournaments. In the worst-case situation of a "shot-gun" tournament, 144 golfers would participate simultaneously. However, golf tournaments would not overlap with other events such as weddings. Invariably, there would be a banquet after a tournament so no weddings or other events would be scheduled on a tournament day. It is expected that there would be an average of one tournament per month at the Lion's Gate Reserve.

Q

COLLIERS
PARRISH

Colliers Parrish International, Inc.
1960 The Alameda, Suite 100
San Jose, California 95126 U.S.A.
408-554-8181• Fax: 408-247-2317

April 25, 1996

Ms. Jaunell Waldo
ENVIRONMENTAL PLANNING
SANTA CLARA COUNTY
70 West Hedding Street, 7th Floor
San Jose, California 95110-1705

Re: **Lion's Gate Reserve Project**
San Martin, California

Dear Ms. Waldo:

This letter is in response to the Environmental Impact Report (EIR) done for Lion's Gate Reserve. I am wonderfully surprised and pleased that the County has required the development of such a project to be put through such a test.

1

This report has been well thought-out and addresses all the issues relating to such a development. I am in full support of this project and feel that such a quality project is needed for our community. The developer seems to have addressed all issues and has come up with a plan that does not destroy the natural beauty of our land.

I would like to thank and applaud the County employees who worked on this project for their careful understanding of the environment.

Very truly yours,

COLLIERS PARRISH INTERNATIONAL, INC.

André R. Walewski
Senior Vice President
408-236-3124

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Q. Response to Colliers Parish International

1. Comments noted. No response required.

R

FORST
COMMERCIAL REAL ESTATE

May 2, 1996

To: Planning Commission
Santa Clara County

Re: 4039-67-28-93DEIR
Lion's Gate Reserve

I am a 20 year resident of San Martin and a 9 year member of the San Martin Planning Advisory Committee. I have thoroughly read the DEIR and am satisfied with the mitigation measures. I do have two points to which I directed my attention:

1) Conversion of agricultural land.

1 The Am zoned portion is currently non-producing. If activated to producing, it would impact water usage and the groundwater. Clustering of homes on the proposed zone change to H is a better treatment because it removes the possibility of higher density at a later time and it leaves the remaining area for recreation and permanent open space.

2) Flooding.

2 The west San Martin area is susceptible to flooding. The creation of a lake (aesthetically pleasing) and the other mitigation measures will alleviate the current situation.

At the April 10 meeting of the San Martin Planning Advisory Committee the members were polled and, although comments were made, the Committee voiced unanimous support for the project.

The developer is extremely sensitive to the environmental issues and has diffused any of my concerns of any negative impact. To the contrary, I feel this project is a positive addition to the rural character of San Martin. I urge your support of this quality development that is proposed in San Martin.

Respectfully submitted,

Pat A. Forst

1190 So. Bascom Avenue, #129 • San Jose, CA 95128 • (408) 279-2664

R. Response to Forst Commercial Real Estate

1. Comment noted. No response required.

2. Comment noted. No response required.

S

April 16, 1996

Juanell Waldo
County of Santa Clara
Environmental Planning Dept.
70 West Hedding St. 7th floor
San Jose, CA 95110

Reference EIR Lion's Gate Reserve and Golf Course

Dear Ms. Waldo:

It was interesting for me to read the entire Draft EIR for the property described above. As a long term resident of Santa Clara County, owner of property in the area, golfer, and environmentally sensitive citizen, it was gratifying to read such a well thought out and thorough report. It seems that the applicant has spend considerable time and effort in trying to satisfy the need and requirements of all the parties concerned.

1

Golf is becoming such a popular sport that it is almost impossible to find a tee time in the county. The need for courses is apparent. However, the amount of land required, coupled with the multitude of issues to solve in building a course is a difficult task. It appears that the developer Hix-Rubenstein have done there homework and the project deserves our support.

Please put me down as an avid supporter of this project.

Sincerely,

William F. Moison

MOISON
INVESTMENT
COMPANY

RECEIVED
PLANNING OFFICE
96 APR 22 PM 4:17

350 2nd Street
Suite 7
Los Altos, California 94022

S. Response to Moison Investment Company

1. Comments noted. No response required.

T

ATTENTION: Ms. Jaunell Waldo, Environmental Planning

To Santa Clara County Planning Commission

From Twin Valley Water
14295 Sycamore Drive
Morgan Hill, CA 95037

RE: Lion Gate Reserve EIP and Geoconsultant Report

1 Twin Valley Water was listed in the above Report as a provider of Water for the Lion Gate Reserve Golf Course. Twin Valley was listed as providing only 14000 gallons per day. This letter is to inform the Commission that Twin Valley has developed two new wells and can now provide Lion Gate Reserve up to 120,000 gallons per day.

2 With the two new wells which are below 4 ppm of nitrates, the two old wells can be dedicated to the Lion Gate Reserve project. This will be a good use of the old wells and the water they supply. Especially since the old wells have a nitrate level above the 45 ppm as government regulations. The Twin Valley main water pipes run along the Watsonville Road area just next to the Lion Gate Reserve.

I feel Twin Valley will provide at least 120,000 gpd of water for the golf course. If you have any questions please call at 408-229-6473.

Sincerely

Steve Havens

Steve Havens
Twin Valley, Inc.
President

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PLANNING OFFICE
96 MAY -3 PM 4:09

T. Response to Twin Valley, Inc.

1. The preliminary water supply study by Geoconsultants, Inc., contained in Appendix M of the DEIR, estimated that the safe yield remaining after Twin Valley fulfills its obligations to its existing customers is 14,000 gallons per day. It should be noted that this estimate is very conservative and is based on rainfall conditions, and takes into consideration the general physical characteristics of the groundwater basin. It is possible that a detailed field investigation of the Twin Valley aquifer would indicate that the safe yield is actually greater than estimated in the preliminary study.

2. Comment noted. No response required.

U

RECEIVED
PLANNING OFFICE
96 APR 26 PM 12: 22

John Ambrose
Chris Ambrose
625 Highland Avenue
San Martin, Ca 95046
April 24, 1996

Planning Commission
c/o Juanell Waldo
County Government Center
E. Wing 70 West Hedding Street
San Jose, Ca 95110

Dear Juanell,

We live on Highland Avenue and we are opposed to massive development in the hills and foothills of San Martin, such as proposed by the Lion's Gate developers. We oppose the development for at least four valid reasons. The EIR(environmental impact report) understates problems with flooding, insurance, water supplies available, and future increases in traffic. The EIR omits any discussion of mortgage insurance problems in an expanding flood zone as determined by FEMA and other government agencies. The report ignores existing county recommendations for not building in flood zones near rivers or creeks.

1 During the last two winters the Highland Creek and the west branch of Llagas Creek overflowed and once the overflow flooded our barn and part of our backyard past the back of the house on 625 Highland. We were notified our home needed flood insurance six months after moving to Highland Avenue in June 1993, costing an additional $1,276.00 per year to the mortgage insurance. The current EIR does not note that the FEMA flood zone will soon increase in size after recent floods and formation of "Lake Highland" near Harding and Highland in the wintertime. This flooding occurred with less than the maximum of 44 inches of rainfall/year in recent memory. Our insurance will certainly go up! Please see the enclosed flood map of 1988. The homes in the area can't tolerate more runoff. Even with the current runoff ditches and small streams flooding occurs, development of land in the area will create a situation for more runoff because the rain will not be absorbed by the ground. The current ditches must be maintained by the water district, although this has not happened in our area.

U. Response to John and Chris Ambrose

1. The drainage and flooding study prepared by Schaaf & Wheeler for the DEIR is based on the updated flood map prepared in 1991, which has not yet been published by FEMA and is only available in draft form. As discussed in the DEIR at Section *III. E. Hydrology and Drainage,* the Lion's Gate project includes sufficient retention basin capacity such that the peak flows from the site during major storm events would be reduced compared to present conditions.

   With respect to the flood insurance question, CEQA requires only that EIRs address the potential physical impacts of proposed projects. Therefore, the analysis of social or economic issues, including insurance matters, is not within the scope of review required for the EIR.

2 We are all aware of the droughts of the late 1980's in this county with water
rationing and dry wells. The EIR fails to show where the surplus water will come
3 from in a drought, nor discuss land sinking with over pumping of ground water.

Since the municipal court, police, and VMC buildings were constructed
4 recently at the Highland and Monterey Highway intersection there has been more
foot traffic without sidewalks plus auto traffic has increased on our narrow road
without shoulders. A truck recently crashed into my walnut trees in front of my
house and the Highland-Santa Teresa intersection is already much too busy with out
further development. The local quite community and our family fear next will come
traffic lights, more accidents, and congestion with the Santa Teresa commute traffic
increasing.

Aside from direct questions about the EIR, we are not aware of any petition
5 by golfers in the area to force upon us another golf course out of "necessity". There
are a number of good golf courses form Almaden to Ridgemark, which are usually
busy on weekends and holidays. The contractor, Hix, has not convinced us of a need
6 at this time. If any thing is needed in San Martin it is more horse trails in the
mountains instead of houses. Perhaps the county could create a park instead of an
exclusive club for increasing the tax base. This may be an area that could be
purchased by the Open Space Authority of the county for the use of all residents.

Sincerely,

John Ambrose

John Ambrose M.D.

Chris Ambrose

BIOLOGIST

2. On-site groundwater resources are not sufficient to meet the irrigation needs of the golf course, except possibly after very wet winters. Thus supplemental water supply would be obtained from off-site sources, principally West San Martin Water Works. This water company draws from 400-foot deep wells in central San Martin, and no difficulties whatsoever were experienced by the water company during the last drought. During the height of the drought, water levels in the Llagas aquifer dropped only to 112 feet below the ground surface, far above the level of the water company's pumps. (The Santa Clara Valley Water District, in a memo dated June 26, 1996, has indicated it concurrence that there is sufficient water available for the project. This memo has been added to the EIR and is included in Section *VI. REVISIONS TO THE APPENDICES OF THE EIR.)*

   The pumping of on-site groundwater at the Lion's Gate site would vary from year to year depending on the amount of recharge received from the previous winter's rainfall. Water withdrawals would be carefully monitored to ensure that the safe yield for any given year is not exceeded, and to determine when to suspend on-site pumping and switch to off-site sources of supply. (See Section *II. OVERVIEW OF MAIN ISSUES DISCUSSED IN COMMENTS ON DEIR.)*

3. With regard to potential land sinking or subsidence, this effect would be prevented by not withdrawing groundwater beyond the specified safe yield for the on-site aquifer. As noted in DEIR Section *III. D. GEOLOGY AND SOILS* at page 84, since the sediments underlying the Lion's Gate site are moderately to well consolidated, minimal subsidence or settlement is anticipated to result from moderate irrigation pumping.

4. The intersection of Monterey/Highland is controlled by a traffic signal and has been shown to operate under minor traffic delays during peak hours (Level of Service A or B). Added traffic from approved projects and the proposed project would not significantly change this condition. The peak hour conditions would still function at LOS B which is deemed to be acceptable by County standards.

5. There is no requirement in CEQA that project proponents demonstrate the "necessity" or "need" for their project.

6. As noted in the DEIR, the project includes the dedication of an easement for a shared use trail along the northern site boundary.

V

Ernie Donato
12605, Harding Ave
San Martin, Ca. 95037

Ms Judrew Waldo
Advance Planning Office
County Government Center, East Wing
70 West hedding Street
San Jose, Ca. 95110

Subject: Notice of preparation for Lion's Gate Project, Santa Clara
County, California (SCL number 4039-67-28-93)

Dear Ms. Waldo:

I attended a meeting in San Martin of the proposed Lion's Gate Project planned for Hayes Valley on the South side of Watsonville Road between Morgan Hill and Gilroy. After reviewing the proposal, the 3 serious issues that were not completely addressed were land use, water shed, and impact of development on rural surrounding areas.

1 I.)Land use: Ag20 was assigned because it complied with the moratorium passed in —-—-1974 which required land to be sub-divided into 20 acre parcels allowing each ranch owner/buyer to provide their own sewer system, water and utilities on an individual basis rather than having a third party management/association. Associations do well early in the project, but when the residence who live their find that Not all of the funds are going where they should, it is usually too late because by then the project is sold to another Association that tries in vain to balance the budget. As a result, the project begins to show signs of neglect and carelessness- which can have an impact on the surrounding areas.

2 .)Water Shed: As the San Martin Council member stated, 'During a drought year, San Martin Water Shed cannot provide the water capacity required by the project and still insure surrounding/neighboring wells from going dry'.

A) During a drought year farmers have the most to lose, but even local home owners pay more because it takes more electricity to pump up a smaller volume of

V. Response to Ernie Donato

1. The package wastewater treatment plant would not be operated by the homeowners association, but by a Community Service District. CSDs are special districts provided for under state law and created by the County of Santa Clara Local Agency Formation Commission (LAFCO). Therefore, the CSD for the project would exist as a separate entity with its own governing board not subject to the control of the golf course operator or homeowners association. Since the CSD would be funded through a special assessment included in the property tax bills, the proper maintenance and operation of the treatment plant would be assured over time.

2. As discussed in the DEIR, West San Martin Water Works would provide supplemental irrigation water supply for the golf course. During the recent drought, the water company experienced no water shortages or other drought-related difficulties. Naturally, the groundwater levels declined in response to lower than normal annual recharge, as would be expected. It should be noted that for the Lion's Gate project, monitoring wells would be located on-site, which together with existing off-site wells would be constantly monitored to ensure that groundwater pumping at the site is suspended before the safe yield for the aquifer is reached in any given year.

water. the only ones who do well in a drought are companies like Chappell pump & Supply and Azeveco Well Drilling.

3 B) During a drought year their is not enough natural run off to sustain a 20 acre lake, but if we allow this lake to go in, San Martin Water Works could be held liable for maintaining a minimum water level to keep endanger wildlife that become residence their from becoming extinct.

4 C) Some of the latest Golf maintenance equipment includes a golf ball washer that uses Krytonite ball cleaner. It claims to be biodegradable and non-toxic, but I did not actually read the label. Can anyone verify their claim? It is made by Range Land USA, 2331 south Seventh St. San Jose, Ca. 95112. There is also a ball socker with conveyor attached that moves 3000 balls per minute into the ball washer. Don't know what is used in ball socker. My question is: if the project does intend to use this type of equipment, where will the used cleaning solutions be dumped?

5 1.) Impact on Surrounding Areas: Many neighbors are already taxed beyond ability to pay. If this project goes throughout, it will increase land value and result in higher taxes

6 for the over all community. The community is already seeing high nitrate levels in the water, and we cannot afford another risk to our water supply.

Sincerely, Ernie Donato april 21,1996

Ernie Donato

3. The proposed 20-acre lake to be located in the residential area near Turlock Avenue would be naturally fed by groundwater and would not be lined. Therefore, water levels in the lake would be expected to fluctuate seasonally and from year to year depending on rainfall amounts.

4. The ball washers would contain water with a very small solution of common dishwashing liquid. The detergent selected would not contain phosphates and would be biodegradable. The small amount of solution involved could be periodically discharged directly onto the turf with no significant water quality impacts.

5. Under Proposition 13, property tax increases are limited to no more than 2 percent annually. Therefore, external factors would have no impact on property tax rates for existing owners.

6. As discussed on page 198 of the DEIR, the nitrate levels would not increase as a result of the project. The new sources of potential nitrate loading represented by the wastewater treatment system and golf course fertilizers would be offset by the removal of cattle grazing from the site.

W

Lion's Gate Reserve (Hayes Valley) Golf Course

Below are my comments on the Draft Environmental Impact Report for this project. (Note: Your opinions on the merits of the project should be sent directly to the Planning Commission prior to the approval hearing.)

1) The number of stream crossings (13?)
1 should be reduced to minimize impacts on the riparian corridor consistent with the County's Golf Course Guidelines.

2 2) Require a permanent conservation easement over the golf course

3 3) The 20,000 sq. ft. equestrian facility combined with the outdoor horse rink and ancillary facilities should be scaled down to reduce runoff downslope + potential flooding onto Turlock Ave.

4 4) Structures for private use - Clubhouse, tennis, swim, equestrian should not be counted as open space based on the County's own dedication requirements!

Please provide the following information so we can provide you with a response to your comments. Please print clearly.

Name Timothy Duff

Address 960 Alice Lane #3
Menlo Park, CA 94025

Written comments can be sent to Jaunell Waldo at the County Planning Office, 70 W. Hedding Street, San Jose, CA 95110 until May 3, 1996.

5 5) Equestrian Center should require a separate use permit.

W. Response to Timothy Duff

1. The total number of stream crossings in the development plan has been reduced from 16 to 11 crossings.

2. The question of whether an easement would be required over the golf course is a policy question to be addressed by the County decision-makers, and is outside the scope of the EIR.

3. As discussed on pages 24 and 103 of the DEIR, drainage through the equestrian area would be reduced as much as feasible by routing drainage originating up-slope around the equestrian center to the proposed lake. This would offset the minor increase in runoff resulting from the impervious surfaces of the equestrian center.

4. The clubhouse and the swim and tennis center lie within the golf course site and are not included in the acreage calculation for the permanent open space area. The equestrian center is located within the open space area, as provided for in the cluster ordinance which allows such areas to be used for recreational facilities for the project's residents. The equestrian center is proposed to house residents' horses, instead of having individual horse stables on each lot, as permitted in the HS zone. It should also be noted that the permanent open space area contains 282 more acres than is required to make up 90 percent of the total hillside-zoned area.

5. As part of the cluster development, the equestrian center would be included in the cluster permit for the hillside cluster residential area.

X

1005 Highland Ave
San Martin, Ca. 95046
April 26, 1996

Jaundell Waldo
Env. Planning Dept.
San Jose, Ca. 95110

Re: E.I.R. Lions Gate Reserve

Dear Ms. Waldo,

Last Tuesday evening in Morgan Hill we had the opportunity to meet with approximately one hundred citizens to listen to Tom Hix present the "Lions Gate Preserve" Project.

1 For forty minutes with overhead screen and large architectural drawings, Mr Hix carefully presented every aspect of the project, which was followed by a tremendous

X. Response to Lyle and Esther Hughes

1. Comments noted. No response required.

round of appreciative applause.

We were all given a draft of the "Environmental Impact Report", also, a copy of "Lion's Gate Reserve Project," which we have carefully studied and appraised.

It was gratifying to witness that every aspect of concern environmentally had been addressed minutely, adequately and satisfactorily. In fact
2 here is a project in which we can have justifiable pride, one that can be a superb model for many years to come.

We are landowners adjacent to this project and are excited about what is going to happen. This project has our enthusiastic and full support!

Most Sincerely, Lyle & Esther Hughes

2. Comments noted. No response required.

Y

Responses and questions by Doug Marlitt regarding: 4/26/96

Draft Environmental Impact Report -- Lion's Gate Reserve
Volume III, Appendix M - Water Supply Reports and Documentation
Volume I, Section P

Ref: 1. Geoconsultants, Inc.
San Jose
Project # G1022-01
John Hofer April 6, 1995

2. West San Martin Water Works
1005 Highland
San Martin
Bob Ukestad Nov 30, 1995

3. Geoconsultants, Inc.
San Jose
Project # G1022-01A
John Hofer Feb 20, 1996

WATER SUPPLY

1.Geoconsultants' reports mention "preliminary" or "very preliminary" 13 times. Geoconsultants 4/6/95 report states well location studies and aquifer testing was outside the scope of the Hayes Valley on-site report and offers its services to perform a "detailed basin water balance study to more accurately determine safe yield figures, or on-site studies for water well location." Geoconsultants 2/20/96 report states "It should be noted these figures are preliminary in nature. In order to assure that the projected supplies are realistic, a detailed aquifer analysis will need to be performed at the Lion's Gate Reserve. In addition, it may be necessary to perform further studies in the West San Martin and Twin Valley areas." (Aquifer tests include drawdown data from observation wells and on-site specific hydraulic characteristics.)

1 ***When will the on-site aquifer and well studies be completed? Because the site***
2 ***will be very dependent upon on-site water availability for irrigation, should***
project approval be delayed until water availability is established empirically?
3 ***What will be the affect on neighboring wells on the same aquifer (or very close***
to it) when irrigation begins?

2. In Section IIID, Geology and Soils, impact #10 states: "As discussed in section IIIp, Water Supply, on-site wells would be used to augment irrigation water supplies from Twin Valley, Inc. However, on-site pumping would not exceed the estimated safe yield of

Y. Response to Doug Marlitt

1. The best time for conducting the study of hydrogeologic characteristics is in the late summer or early fall when the groundwater table has reached static conditions. Any investigations conducted earlier in the year would be still influenced by the previous winter's rainfall.

2. There is no doubt on the part of Geoconsultants that more than sufficient water supplies are available to serve the project from on-site groundwater, in combination with supplemental supplies from West San Martin Water Works and Twin Valley, Inc. (The Santa Clara Valley Water District, in a memo dated June 26, 1996, has indicated it concurrence that there is sufficient water available for the project. This memo has been added to the EIR and is included in Section *VI. REVISIONS TO THE APPENDICES OF THE EIR.)* However, additional studies are required to define the characteristics of the aquifer, for purposes of determining the optimum location(s) of production of well(s), and to establish setback distances for these new well(s) to ensure that they do not have an impact on off-site wells.

3. There is no doubt on the part of Geoconsultants that there is sufficient area available on the site such that the required production well(s) can be placed in locations where they will not result in off-site impacts. (See Response #5 below.)

280K gpd based on an average daily used, therefore, the on-site water table is not expected to be lowered as a result of supplemental irrigation pumping at the site".

4 ***Hayes Valley is the prime irrigation source augmented by Twin Valley's***
minuscule 14K GPD -- Hayes Valley is not a supplemental source. What
5 ***measures will be taken to ensure no overpumping during drought years when***
lower rainfall cannot be expected to replenish the aquifer?

3. Hayes Valley's aquifer recharges from rain only -- there is no groundwater inflow. The recharge rate of 470ac-ft/yr is calculated from a 25-year old report. Twin Valley on-site recharge is only from rain, also. We have had two droughts in the past 20 years. Section III P, "Water Supply", overlooked that the development will require twice the water in its
6 first year as was mentioned on page 30 in the project description. This fact was not mentioned in the Geoconsultants, Inc. reports, either. All figures are based on average usage's. Peak demands go unaddressed -- in the first year, irrigation needs would demand 300% of the on-site availability during a six-month period; 54% every year thereafter. The Geology and Soils section says "....minimal subsidence, or settlement, is not anticipated to result from moderate irrigation pumping". The additional 300% the first year and 54% every year after is not "moderate". The first year alone will pull 15% from the aquifer (if full) over and above the annual recharge rate.

7 ***Is there data more recent than 25 years old regarding rainfall? Should the safe***
yield figure be recalculated to be realistic? What measures will be taken to
8 ***prevent overpumping in drought years when the aquifer recharge rate is***
9 ***inadequate? What thresholds will be established to prevent misuse of the***
aquifer supply and its possible affect upon subsidence and neighboring wells?
10 ***How can peak demand during the six, or so, dry months be mitigated by using***
averages?

4. Page 184 - on-site groundwater states: " There are 4 agricultural wells on the site which were previously used for irrigation supply, but are no longer in use." They aren't mentioned in Geoconsultants, Inc. reports

11 ***Why are these wells unused? No demand for them or are they dry? Has the***
water supply ever been inadequate for them?

5. On-site well(s) locations or depths are not defined. Geoconsultants states there would be impact to off-site wells if on-site wells are placed too close to eastern down-gradient wells. Section P states: "The precise location of the on-site irrigation well (sic) would be determined prior to project development, based on primary locational criterion of resulting in no down-gradient impacts."

Who determines well location and when? Who approves this? What about
12 ***northeastern down-gradient wells? What is a "prudent distance"? Where are***
the required professional studies that are not preliminary?

4. The referenced statement has been revised to reflect the fact that the Hayes Valley aquifer is the primary source of irrigation water. (See Section *V. TEXT AMENDMENTS.)*

5. A downgradient monitoring well on the site would be monitored constantly during pumping operations to observe any drawdown in the water table, which would provide an indicator of when to suspend on-site pumping and begin drawing exclusively from supplemental sources. In addition, existing off-site wells would also be monitored to ensure that impacts are not occurring.

6. The referenced discussion on page 30 of the DEIR states that water applications would be approximately double normal irrigation rates during the 6-month grow-in period, which was a very conservative estimate. This discussion has been revised based on the experience of the Silver Creek Valley Country Club, which has conditions very comparable to the Lion's Gate site. At Silver Creek, the grow-in period lasted 1.5 to 2 months, with water consumption rates only a small percentage higher than during subsequent years. The total water consumption during the first year was 140 million gallons over 120 irrigated acres, versus 130 million gallons for subsequent years. The estimated average annual irrigation water consumption for the Lion's Gate golf course is 122 million gallons over 97 irrigated acres. It is also important to note that grow-in occurs either in the spring or fall; the summer period is avoided to prevent burning the seeds, and winter is avoided to prevent the risk of washouts during heavy rains. (See Section *V. TEXT AMENDMENTS.)*

7. The rainfall information cited from Rantz (1971) consisted of an isohyetat (rainfall control) map of the greater Bay Area. The precipitation values were based on specific gauges throughout the area, and represent average rainfall for the 50-year period between 1906 and 1956. Although this study has not been updated since then, the gauges have continued to monitor rainfall. There is no precipitation gauge presently installed at the site; however, a gauge in Gilroy has determined average annual rainfall to be 20 inches for the period of 1957 through 1994. Rantz's isohyetal map showed rainfall at Gilroy to also be 20 inches for the period from 1906 to 1956. Therefore, due to the proximity of Gilroy to the site, it can be assumed that the annual rainfall for Hayes Valley has also continued to be the same as indicated in the preliminary groundwater study (at 21 inches).

8. The principal means of preventing overdrafting during drought years would be the suspension of on-site pumping when the monitoring wells indicate the approach of unacceptable drawdown levels. Under severe drought conditions, it is reasonable to assume that little or no water would be available from on-site groundwater or Twin Valley, Inc. Thus all of the irrigation water supply for the project would have to be supplied by West San Martin Water Works. According to the Geoconsultants report of February 20, 1996 (contained in Appendix M of the DEIR), WSMWW has more than sufficient surplus safe yield to provide for all of the project's irrigation requirements.

   The water company draws from three 400-foot deep wells in central San Martin, and no difficulties whatsoever were experienced by the water company during the last drought, so no rationing program had to be implemented. During the height of the drought, water levels in the Llagas groundwater basin dropped only to 112 feet below the ground surface in the vicinity of the wells, which is far above the level of the water company's pumps at 400 feet below the ground surface. It is also worth noting that the overall water demand in the West San Martin service area has actually declined over the years with the reduction in agricultural irrigation.

   In the event of a prolonged drought, a drought contingency plan would be instituted at the golf course to reduce irrigation water demand. As discussed on page 189 of the DEIR, water usage at the golf course would be cut back in phases. As a drought develops and/or water supplies diminish, irrigation applications would first be reduced in less critical areas such as fairways. As conditions worsen, irrigation of fairways

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would be further reduced or suspended altogether, depending on the severity of the drought. During this time, irrigation would also be reduced on higher priority areas such as tees and fairway landing areas, to a level which would still maintain plant life, but at a severely stressed level. The greens would be the last to have reduced irrigation because they include the most critical turfgrass, and because they make up only about 4 percent of the total irrigated acreage.

9. As the operation continues over the years, the project geohydrologist would maintain a record of rainfall and well pumping in relation to water table drawdown. This would enable a better understanding of aquifer characteristics and capacities that would in turn provide a basis for predicting available groundwater for a given year based on the previous winter's rainfall. The golf course would include a weather station and rain gauge, which would allow for calculations based on known rainfall amounts at the site.

10. As discussed in Response #5 above, once on-site groundwater levels begin to approach unacceptable levels, on-site pumping would be suspended and off-site sources such as West San Martin Water Works would be relied upon exclusively for irrigation supply.

11. The on-site agricultural wells are not currently used because there is currently no demand for non-potable water at the site. There is no well history available on these agricultural wells.

12. In response to these concerns, Geonconsultants prepared the following summary of the geohydrologic studies that would be conducted to provide the detailed information required.

> Initially a 24-hour aquifer test will be performed on one of the existing wells on the property. Static water levels will be measured in the pumping well as well as a monitoring network of at least one on-site well and one off-site well (i.e., existing wells on neighboring properties). Drawdown and recovery levels will be recorded in all wells during the pumping test. Based on the results of the aquifer test, calculations of transmissivity, specific capacity, and storitivity will be prepared. This information will enable the geohydrologist to make a determination as to the maximum radius of pumping influence (see diagram on page 4). Once this has been established, a setback line can be drawn so that new on-site production wells will not have an impact upon existing off-site wells.
>
> Once the setback line has been established, an on-site survey for the purpose of locating one or more on-site production wells will be performed. Based on the results of this survey, one or more production wells would be constructed, and the water-bearing characteristics of the formations evaluated.
>
> A 72-hour pumping test to determine well production parameters such as specific capacity and recommended pumping rates will be performed following construction. At the conclusion of the test, a water sample will be collected for an evaluation of constituents in accordance with State and County drinking water standards.
>
> A monitoring well network will be developed including the production well(s), other on-site wells and appropriate off-site wells (i.e., existing wells on neighboring properties). In order to develop a water level history, measurements will be taken in each of the wells for an extended period of time. Individual well hydrographs will be developed. In addition, a precipitation gauge will be installed at the site in order to develop accurate rainfall totals. This information will allow periodic updates of the aquifer characteristics, and assure that an overdraft condition would not occur.

7. Geoconsultants' report states average domestic usage will be 150K GPD -- Section P states 114K GPD.

13 ***Which is correct?***

8. WSMWW storage capability with the new tank will be 450K gallons -- a single day's peak usage. Current storage is 150K -- 34% of peak usage.

14 ***When is WSMWW's new storage tank going to be completed?***

9. Mitigation 1b in section P quotes the Geoconsultant report in appendix M to say "...the pumping of on-site groundwater *would* not result in impacts to wells immediately down-gradient to the east...." Geoconsultants, Inc. says *should*.

15 ***There is difference between "would" and "should". "Would" implies a definite conclusion, "should" implies an educated guess. Will there be impact, or not?***

TRAFFIC

The traffic generated by this development, in and of itself, may not appear to have significant affect, but the EIR does not address the increasing traffic along the Santa-Teresa/Coolidge north-south route through San Martin by West Gilroy residents. There is absolutely no traffic control between First Street in Gilroy and Watsonville Road in Morgan Hill. Following the building of the new wide straight road between Day Road and Highland which bypassed the Turlock dogleg, traffic volume and speed have increased dramatically. The stop sign suggested for Turlock affects only a dozen, or so, residents on Turlock who will now have to stop for Hayes Valley traffic.

16 ***I believe the EIR understates the overall inevitable congestion and safety hazards at adjacent roads. There should be traffic control on Coolidge/Santa Teresa where it intersects with Highland.***

FLOODING

17 FEMA is revising its Flood Insurance Rate Map for San Martin. Quoting, "the proposed 100 year flood plain for West Branch Llagas Creek near Highland Ave. is significantly larger on the revised maps than on current maps".

There will be a 33% increase in upstream runoff from the development. Turlock, Coolidge and Highland avenues already flood, without the addition of upstream development. Regardless of mitigating lakes and ponds, the additional flood water the development will cause will still have to go somewhere when those lakes and ponds fill up. The EIR mentions a waiting period of 24 hours after a storm before allowing held flood

13. The estimated average daily demand for potable water at the project is estimated to be 114,000 gallons. The figure of 150,000 reflects the volume of water which West San Martin Water Works has committed to providing per their letter which is included in Appendix M of the DEIR. However, WSMWW has indicated in a letter dated June 7, 1996, that it could provide more water if needed. As mentioned above, the Santa Clara Valley Water District concurs with this, as discussed in their memo of June 26, 1996. The WSMWW letter and the SCVWD memo have been added to Appendix M of the EIR. (See Section *VI. REVISIONS TO THE APPENDICES OF THE EIR.)*

14. Bob Ukestad, the General Manager of West San Martin Water Works, indicates that the water tank will be complete and operational by mid-1998, the projected date for completion the Lion's Gate golf course. (See June 7 letter noted above.)

15. As discussed in the responses above, the well-monitoring program will ensure that on-site pumping will be suspended when the groundwater table approaches unacceptable levels.

16. The traffic study was completed in April 1995 and included all the projects in the cities of Gilroy, Morgan Hill and unincorporated Santa Clara County approved up to that date. Since the release of that study, a new development in Gilroy (Deer Park/Rancho Hills) was approved that included 294 units. However, it is expected that only minor traffic will be added to the project area from this development which lies several miles to the south.

    It is acknowledged that as traffic growth does occur in San Martin, the traffic controls at local intersections may need to be upgraded even though no such improvements are recommended to serve this project. The forecasted peak-hour volumes at Highland/Santa Teresa (the project entrance) are well below the level needed to warrant All-Way STOP controls. The existing 2-way STOP controls would be adequate. However, the County, at its discretion, may elect to place an All-Way STOP control at the Highland/Santa Teresa intersection to control the known speeding problem on Santa Teresa Boulevard. The Santa Clara County Roads Department is responsible for evaluating the need for All-Way STOP or traffic signals on major streets in the county. These evaluations follow standard technical guidelines which judge vehicle speeds, volumes and accident histories.

17. The flooding study prepared by Schaaf & Wheeler for the DEIR is based on the updated flood map prepared in 1991, which has not yet been published by FEMA and is only available in draft form.

waters to drain into the West Branch Llagas Creek so the holding ponds can take on more water. Once the holding ponds are full, storms will not conveniently stop every 24 hours. As a resident, I also know the West Branch Llagas Creek doesn't subside that quickly – it's several days, if not weeks, after a storm before it subsides. The proposed mitigation for handling the additional runoff from this development will only be effective when storms are evenly spaced enough to allow lowering the holding ponds' flood levels.

18 ***When storm periodicity precludes the emptying of excess water from the holding ponds, where will this water from the holding ponds go when they overflow?***

One quarter of Lion's Gate's homes will be built in flood zones. The diverted water from new homes planned north of the creek has to go somewhere. This fact was overlooked in the EIR. This water will be diverted north, guided by a proposed berm along Coolidge to flood lower neighboring properties. Flood waters already occurring in this area currently break over Coolidge avenue between Powder Horn Court and Steven's Court to find its normal route.

The County Drainage Manual issues guidelines to ensure there are no off-site drainage problems associated with a project.

19 ***The EIR understates the development's impact to neighboring San Martin residents and does not completely mitigate off-site drainage impact to existing neighbors, north or east.***

Thank you for this opportunity to comment.

Doug Marlitt

Doug Marlitt
12845 Coolidge Ave.
San Martin, Ca. 95046

D - 434-0601 x3408
E - 683-4046

FAX PAGE 5 OF 5

18. The outfall from the lake into West Branch Llagas Creek would be designed so that no flows from the lake could enter the creek until the flows in creek have receded. In the event that the lake completely fills up with flood water from the site, the pond would be designed to permit overflows toward Turlock Avenue, as would occur under current conditions. However, the volume of these flows would be lower than under current conditions, since much of the flood water would remain stored in the lake.

19. Comment noted. The berm along Coolidge Avenue would be designed with sufficient breaks such that the direction of sheet flows during major storm events would not be altered relative to existing conditions. The EIR has been revised to clarify this point. (See Section *V. TEXT AMENDMENTS.)*

It is important to note that the project would not be responsible for mitigating drainage and flooding that would occur under existing conditions, but rather to avoid or mitigate any increase in flood hazard resulting from the project.

Z

The Meadows

4/25/96

Santa Clara County Planning Commission
70 West Hedding St
San Jose, CA 95112

Re: Hayes Valley/Lion's Gate Proposal - EIR

Dear Commissioners,

This letter is to address concerns surrounding the proposal. I represent a 16 home subdivision figuratively and literally downstream from Hayes Valley. My immediate concerns would involve downstream flooding and traffic. I have read the DEIR and have the following comments:

Downstream Flooding
The Meadows borders the West Branch of the Llagas Creek which is the drainage channel for the Hayes Valley project. The San Martin/North Gilroy area has been subject to repeated sheet flooding occurrences that have closed Fitzgerald and Day Roads repeatedly as well as some structure inundation. The PL 566 project has been completed to Day
1 Road and it is obvious that there is no money from SCVWD, SCS, the County, or the State, to extend the project. Many of us in the area have sought some action to protect the lands in the area. I am very pleased to see that this project will result in an **improvement** of the local flood situation due to the creation of several onsite detention facilities. Please look favorably on any such structures that improve the hydrology of the area and consider the long range benefits to the area wide drainage problems when considering the expansion (if proposed) of such detention facilities. The DEIR did not address the fact that this onsite detention would also create wildlife habitat. From personal experience I can say that this too would be a positive environmental impact.

Traffic
The Meadows is again downstream of the traffic impacts of the project. Upon review of the DEIR I am assured the impacts are less than significant. Upon reflection I realize that golfers are given starting times that are separated by 7-12 minutes and the maximum

R. Jeffrey Martin • Broker
101 Green Valley Drive • Gilroy
(408) 848-1151

Z. Response to Jeffrey Martin

1. Comment noted. No response required.

group size is four people. This metering of golfing would be paralleled in the traffic
2 pattern created by the golfing component. I would expect to see cars coming and going at
the rate of about 2-4 cars every 10 minutes. Therefore, as a neighbor, I feel that the
project impact is minimal. Also it seems that the traffic patterns would be reversed from
the existing local traffic. This too would reduce the impact.

While all aspects of the project are important these two areas caused me the most concern. In light of the extensive studies made in connection with the DEIR I think that this development would be an asset to the San Martin community.

Please feel free to call if there are any questions concerning this letter.

Sincerely,

Jeff Martin
848-1151

cc: Jaunell Waldo

2. Comment noted. No response required.

Z1

May 1, 1996

Jaunell Waldo
County Planning Office
70 W. Hedding Street
San Jose, CA 95110

Re: Lion's Gate Reserve (Hayes Valley) Golf Course

Dear Jaunell,

My husband and I are building a home on a parcel off Watsonville Road that will have a shared fence line with the above development. We did attend the planning meeting that was held in San Martin, and I have recently had a phone conversation with Tom Hix. We have the following concerns regarding the Draft Environmental Impact Report:

• The entrance off Watsonville road is designated to be *minimal*
usage. Per my conversation with Mr. Hix, *minimal* usage means a
supply truck once a week and five to six employees per day coming in the
morning and leaving in the afternoon. This sounds reasonable to us. Our
concern is that the actual usage not exceed these parameters and that
there will not be heavy duty trucks coming and going, ten to
twenty employees a day, or golfers exiting onto Watsonville road. Mr. Hix
indicated that there will be a gate on the Watsonville road side, but we are
not sure how he will keep golfers and others leaving the golf course from
1 exiting out this way. We would appreciate this being addressed and stated
in the EIR to avoid any problems or confusion further down the line.

• Noise travels extremely well in the Hayes Valley area. For example, if
2 you are standing on our property you can hear a conversation taking place
at the ranch across the street. We are concerned about parties and events
at the clubhouse/hotel and the possibility of hearing amplified music
at our home. We would like to see a requirement enforced and stated in
the EIR that prohibits amplified music from being played outside the
clubhouse/hotel or on the golf course grounds. Recently we know that the
Los Altos Hills Country Club golf course has upset many neighbors by
holding parties outside the clubhouse and on the golf course grounds. Even
though the homes are closer in the LAH Country Club area, the impact will
be the same because of the extreme and concentrated way noise travels

Z1. Response to Shelley E. Moeller

1. Since there would be no through-connection between the clubhouse area and Watsonville Road, it would be physically impossible for golfers and others to enter or exit via Watsonville Road.

2. The home referred to in this letter would be approximately 8,000 feet away from the proposed clubhouse. Noise attenuation over this distance would be significant. It was calculated by Illingworth & Rodkin that if loud music were played inside the clubhouse even with the windows open, noise levels would be inaudible under all conditions on this property. If a band were playing at high rock concert levels outdoors, it would be possible that the sound would be noticeable at this home. Typical party band noise levels might also be audible but they would not be significant. Even under worst-case atmospheric conditions, noise levels would not exceed County limits.

through the interior Hayes Valley area.

3 • The public trail is a great idea and I know our family will enjoy it. However, we strongly suggest making it strictly a walking/jogging and equestrian trail. You are asking for trouble if you let bicyclists also use this trail. The combination of bicycles and horses is deadly. Bicyclists have a tendency to go very fast and sometimes do not see the person or horse around the bend. Furthermore, most horses will spook at bicycles, and there is a strong chance that the bicyclist or the horseback rider could get seriously hurt. There is a park in Woodside (Huddart) that considered letting bikes on a few of the trails, but the county voted it down for these reasons and many others. Besides, there are many horse owners in this area and horses complement the flavor and environment of the valley.

Thank you for considering our comments and concerns before you approve the EIR report for this project. Before moving to Morgan Hill, we lived by a well known golf course and are very familiar with the noises they can generate. We will be investing a large portion of our net worth into our home and property. We are planning on living there a long time (fifteen to twenty years) and would not want the above issues to preclude us from doing so or cause us to lose money on our investment. By the way, we will not hesitate to file noise or disturbance of the peace complaints if we find any noise from the development offensive. In order to avoid any problems in the future and to ensure that we all get along, I would appreciate the above concerns being addressed and incorporated in the final EIR report. Please feel free to call us with any questions or comments.

Sincerely,

Shelley E. Moeller

3. Although an easement for a shared-use trail would be dedicated by the project, the trail would not be constructed by the applicant. The issue of whether or not bicycles would be permitted on this trail would be addressed by the County Parks and Recreation Department in the environmental review process for the trail, which would be required prior to their construction of the trail.

Z2

RECEIVED
PLANNING OFFICE

96 APR -9 AM 10:30

Dwayne and Cathy Turpin
665 Highland Avenue
San Martin, California 95046
April 6, 1996

Juanell Waldo
Santa Clara County Office of Advance Planning
County Government Center, East Wing
70 W. Hedding Street
San Jose, California 95110

Dear Juanell:

As a neighbor of the Lion's Gate Project we are directly concerned by the following items that have been glossed over in the DEIR.

Flooding Hazards

1 For the past two years the section of the West Llagas Creek that runs through my property has crested and has over run its banks on neighboring properties. This is without any land being paved over or irrigation in process. If this project is allowed to continue we will definitely flood.

2 According to area maps this project lies within a FEMA flood zone. County regulations forbid building in flood zones. Why is this project an exception?

3 If this project is allowed to proceed and it causes flood damage to our property, we want a stipulation that the developers will cover any damages to our property and expenses we may incur. Also the County should plan on dredging the creek in our property and building a berm on the structure side of the creek to alleviate damages.

4 There is only passing mention of the drainage proposal for the six unit cluster housing bordering Coolidge Avenue. It is planned that they will drain directly into the west Branch of the Llagas Creek. This alone will cause us to be underwater during next winter's rains.

Urbanization

5 Throughout the DEIR it is stating that this project is consistent with the changing of this area from rural to urban in character. This area of San Martin is certainly not urban in

Z2. Response to Dwayne and Cathy Turpin

1. As noted in the DEIR, the detention basins, lakes and ponds to be incorporated into the project would provide sufficient storage during major flood events such that downstream flooding impacts would be reduced relative to current conditions.

2. Building is not permitted in the 'floodway' portion of the flood-prone area, which carries 99 percent of the flow. However, building and fill is permitted in adjacent areas subject to shallow flooding, provided an equivalent area of storage capacity is provided on-site such that the overall volumetric capacity of the flood zone is not reduced and the boundary of the flood-prone area is not expanded. As discussed in the DEIR, the project complies with these requirements.

3. As noted in the DEIR, the project would not result in increased downstream flooding hazard.

4. According to the project engineers, Forsgren Associates, the drainage from the six-unit cluster development would drain to a small retention basin located in the northeastern portion of this site. (The DEIR has been revised to incorporate this new information.) Since the impervious surface coverage added by the project would represent less than 10 percent of this area, the additional runoff would be minor and would be readily accommodated in a small basin. Thus this portion of the project would not increase flooding potential downstream.

5. See following page for response.

any sense of the word. It is changing from rural to rural-residential and this commercial
5 project is thoroughly inconsistent with the present zoning and the established neighbor
6 hoods. Cluster housing is inconsistent with the rural ambiance now present in this area
no matter how much open space surrounds them. The grape vineyard proposed as
screen for the project is inadequate. Grape vines do not provide much in the way of
7 screening and require a great deal of water. We should know as we have 75 plants on
our property.

Traffic

8 The traffic control study was done two years ago. Much housing has been developed
9 along Santa Teresa in Gilroy since then. The traffic is much heavier than this study
leads one to believe.

10 The traffic projection table on page 157 is so inaccurate that it is unbelievable. Of the
41 new homes to be built, it will only generate 19 trips out during peak a.m. hour. Most
homes will be two income families and this figure is way off base for that. The
11 restaurant has only 22 trips in during p.m. peak hour. This place will surely go broke!
They have the audacity to subtract trips for the 7 ranch workers who will lose their jobs
12 due to this project. There is absolutely no mention of the number of employees that will
be part of this development: gardeners, restaurant, lounge, pro shop, motel,
maintenance. It surely will have a significant impact on this traffic study.

13 Throughout the DEIR there is constant mention of "low projected traffic volumes". How
can one sink millions of dollars into a project and expect to recoup their investment with
a statement like that? Any development open to the public will have a high projected
volume of traffic.

Our two lane country road, Highland Avenue, is proposed to be the main "gateway" into
14 this development. There is already lots of congestion at the new justice facility at the
intersection of Monterey and Highland. Our country lane simply is inadequate to
handle the reality of the traffic that will come.

If this project is allowed then we will be living at the intersection of two major traffic
15 arteries. This is certainly not what we envisioned when we moved here two years ago.
It will adversely affect our property values. We want to be compensated if this project
lowers our value. At our expense we will have our property appraised to provide the
developers a baseline value. Other neighbors feel the same as we do.

5. Comment noted. The DEIR states that the Morgan Hill-San Martin area is changing from rural to urban in character. The EIR has been amended to add that the character of the immediate project vicinity is in transition from undeveloped rural agriculture to developed rural residential. (See Section *V. TEXT AMENDMENTS.)*

6. The proposed cluster housing is consistent with the rural residential subdivision adjacent to the site at the corner of Coolidge and Highland Avenues. It is also consistent with the General Plan designations for western San Martin, which is predominantly Rural Residential. The San Martin Community Plan specifically encourages the clustering of this Rural Residential development.

7. In addition to vineyards (and/or orchards), a landscaped berm would be placed along the Coolidge Avenue frontage. Combined with the 300-foot setback area to be planted in grapes or orchards, these elements would provide adequate visual screening and buffering from nearby residences.

8. The traffic study was completed in April 1995 and included all the projects in the cities of Gilroy, Morgan Hill and unincorporated Santa Clara County approved up to that date. Since the release of that study, a new development in Gilroy (Deer Park/Rancho Hills) was approved that included 294 new units. However, it is expected that only minor traffic would be added to the project area from this development which lies several miles to the south.

9. The trip generation rates used in the study were taken from the *Institute of Transportation Engineers Trip Generation,* which is the most comprehensive source available. The peak hour traffic estimates used in the study represent only the two busiest hours of the day in terms of the total traffic traveling on the street. This is also the busiest hour for residential uses. However, it is common for some uses to have busier periods during other times of the day. For example, restaurants typically reach their highest activity between 6:00 to 8:00 p.m., and do not have their highest traffic generation during the peak commute hours studied for level of service impacts.

10. Single-family residences generate an average of 10 trips per day, of which 10 percent or one trip would occur during the p.m. peak hour, and 0.74 percent would occur during the a.m. peak hour. Of these a.m. trips, 74 percent would be outbound as shown on the referenced Table 10 on page 157 of the DEIR. These are professionally accepted generation rates, based on numerous studies, and are applied to all developments of this nature. It is important to note that not all outbound morning trips occur during the same hour, but are spread out over several hours, only one of which is the a.m. peak hour.

11. As noted in Response #8 and above, the peak usership for restaurants does not coincide with the p.m. peak for traffic, but occurs later in the evening.

12. The trip generation estimates for non-residential uses already include all types of traffic for employees, visitors, delivery and maintenance purposes. (See Appendix C of the Traffic Study, in Appendix H of the DEIR, for a full discussion of specific traffic generation factors for the golf facility.)

13. The projected traffic volumes for the golf course are based on many studies done at similar facilities which, have been repeatedly shown to be light traffic generators.

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14. The intersection of Monterey/Highland is controlled by a traffic signal and has been shown to operate under minor traffic delays during peak hours (Level of Service A or B). Added traffic from approved projects and the proposed project would not significantly change this condition. The peak hour conditions would still function at LOS B, which is deemed to be acceptable by County standards.

15. Comment noted. Under CEQA, the preparation of EIR, is to be confined to an analysis of potential physical impacts. Since other effects such as potential social and economic impacts do not fall within the scope of EIR review, questions of property value are not required to be addressed under CEQA.

Z3

April 29, 1996

Jaurell Waldo
County of Santa Clara
Environmental Planning Dept.
70 West Hedding St. 7th Floor
San Jose, CA 95110

Re: EIR Lion's Gate Reserve

RECEIVED
PLANNING OFFICE
96 APR 31 AM 11:14

Dear Ms. Waldo,

As a landowner in San Martin and after reviewing the Draft EIR for the proposed project, I feel Hix Rubenstein Companies have created an environmentally sensitive project.

1 The proposed use of Lion's Gate Reserve for a golf course, overnight facilities, restaurant and homes will be a good use of the land. This is a beautiful piece of property that can then be appreciated by more of the population.

At present San Martin has no overnight facility, nor anything that would entice one to enjoy such a beautiful area. I feel its a compliment to San Martin to have a well designed project like this come into our area. Furthermore it will add fire protection and increase existing property values to our area.

Sincerely
[signature]

Z3. Response to Royanne Ukestad

1. Comments noted. No response required.

V. PUBLIC HEARING COMMENTS AND RESPONSES

The following are not verbatim comments, but are a summary of the issues raised at the May 2, 1996 public hearing held by the Planning Commission on the Draft EIR. Each comment is followed by a response in italics.

AA. Comment by Julia Bott, Sierra Club

Ms Bott summarized the written comments submitted by the Sierra Club - Loma Prieta Chapter (see Comments Letter P).

Refer to Response P.

BB. Comments by Camas Hubenthal, Committee for Green Foothills

Ms Hubenthal summarized the written comments submitted by the Committee For Green Foothills (see Comment Letter M).

Refer to Response M.

CC. Comments by Vicki Moore, Greenbelt Alliance

Ms Moore summarized the written comments submitted by Greenbelt Alliance (see Comment Letter N).

Refer to Response N.

DD. Comments of Pat Forst, Forst Commercial Real Estate

Ms Forst summarized her written comments (see Comment Letter R).

Refer to Response R.

EE. Comments of Craig Breon, Santa Clara County Audubon Society

Mr. Breon summarized the written comments submitted by the Santa Clara County Audubon Society (see Comment Letter O).

Refer to Response O.

FF. Comments of Steve Havens, Twin Valley, Inc.

Mr. Havens summarized his written comments (see Comment Letter T).

Refer to Response T.

GG. Comments of Bob Murphy, Northern California Golf Association

Complemented Tom Hix for doing a great job in undertaking a very thorough planning effort in which every environmental concern has been met in the proposed project.

Discussed the shortage of golf courses in Santa Clara County, and how golfers are forced to travel outside the valley to play.

The project complies with every guideline proposed by the County, whereas if the guidelines were applied to existing golf courses in the County, 80 percent of them would not comply.

There is nothing unprecedented about this project. There are many instances of golf courses being developed in places far more pristine than Hayes Valley, and they demonstrate how golf courses can successfully co-exist with nature and the environment.

This does not represent intense development, but rather the project will be very pastoral and will preserve open space. This project is opposed by people who don't play golf, and don't like golf, and don't want others to play golf either.

Comments noted. No response required.

HH. Comments of Bob Ukestad, West San Martin Water Works

With respect to concerns over the adequacy of water supply, West San Martin Water Works was not hindered at all during the drought by water shortages. Although water customers were encouraged to conserve water, the company did not institute any rationing program. At the peak of the drought, the water level dropped to 112 feet below the ground surface, and it is currently at 30 feet below ground surface after all the rains. During the drought, the water company never had to adjust or lower the pumps in their wells, which are at 400 feet below the ground surface. In fact, there is a lot less water being drawn now than years ago when the area was mainly in agriculture.

Mr. Ukestad gave assurances that the water company would be able to accommodate any water service required by the Lion's Gate project, including all domestic and fire protection requirements.

The water company is currently in the engineering design phase for a 300,000 gallon storage tank that will greatly enhance the fire protection in the area.

Comments noted. No response required.

II. Comments of Royanne Ukestad

Ms Ukestad summarized her written comments (see Comment Letter Z.3).

Refer to Response Z.3.

JJ. Comments of Chris Williams

Commended the thoroughness of the EIR in addressing the issues, and believes that the project will be a model for the County.

Comments noted. No response required.

KK. Comments of John Ambrose

Mr. Ambrose summarized his written comments (see Comment Letter U).

Refer to Response U.

LL. Comments of Thomas Kruse, Planning Commissioner

Commissioner Kruse is concerned that this project will be precedent-setting in this County, if not elsewhere. This project is somewhat unique in that it is fairly large in scope and has commercial, recreational, residential, and open space uses plus a sewage treatment plant. The fact that all these uses are combined in one project makes it somewhat unique. Because of its size and scope and diversity of uses, the Planning Commission should be circumspect and thoughtful in gauging the merits of this application.

The project includes a large acreage, but also demonstrates how the hillside cluster ordinance operates to concentrate permissible development in a confined area while preserving the vast majority of the site as permanent open space. Although the minimum required density for the project is 36 acres per lot, the cluster ordinance provides for 41 lots due to the large size of the site.

All of the uses proposed in the project are permitted in the applicable General Plan and zoning provisions for this site. While a specific project including a golf course and residential subdivision may not have been previously approved in the County, it has been a permitted combination of uses in HS zone for many years. Therefore, it would not be precedent setting in the sense that it would represent a combination of land uses not previously permitted in the County.

In terms of overall intensity of the development, the total coverage of buildings is 1.5 percent over the 410-acre development area (including the golf course area), and 0.4 percent of the total site area. The total coverage by all impervious surfaces, including buildings, roads, cart paths and parking areas is 6 percent over the 410-acre development area, and 1.5 percent of the total site area. Compared with 40 to 50 percent for a typical suburban subdivision, and 80 to 95 percent for industrial park or commercial retail development, the proposed coverages do not represent a large scale or intense development.

The package wastewater treatment plant was included at the recommendation of the County Department of Environmental Health and the Regional Water Quality Control Board, in order to avoid the use of conventional septic systems. This facility would be sized to serve the proposed project only, and it would be extremely difficult if not impossible to expand to accommodate *additional hookups in San Martin.* (See Section *II. OVERVIEW OF MAIN ISSUES DISCUSSED IN COMMENTS ON DEIR, D. GROWTH INDUCEMENT.)*

With respect to Section *III. B. AGRICULTURE,* it is understood that the relocation of housing from the floor of Hayes Valley necessitates taking the frontage parcel out of agriculture. The EIR states that the loss of 110 acres of prime agricultural land would be offset by the planting of vineyards in areas not proposed for development, and by the fact that the site is not economically viable for cultivation. The latter argument is a myth perpetuated over and over, and is used every time someone who doesn't want to farm anymore, or where it is more profitable to do something else. Taken to its logical extreme, this means that agriculture would be forced out of the County, which is not reasonable or desirable. The County has just completed an agricultural preservation study to try to help preserve agriculture. Granted there are interface problems where you have a mixture of rural and non-rural uses, and the project addresses this by providing buffer zones along the eastern frontage.

The Niles report on agricultural economics of the site states that crop yields are lower in Santa Clara County, but with local soil and climate conditions yields should be as good as anywhere. It is unclear from the analysis how Santa Clara County is at a competitive disadvantage to the San Joaquin Valley for agricultural production.

Refer to Response J.3.

It is unclear in the DEIR how many acres of vineyard would be planted or where they would be located.

Refer to Response J.1.

With respect to parks and open space, the EIR stresses that 1,265 acres would be preserved as open space. There is a concern that the open space should be permanent open space and that a portion should be dedicated to an agency so that the homeowners association or somebody can not change this is in the future.

As required by Policy R-LU 20 of the 1995 County General Plan, an open space or conservation easement over the permanent open space area would be dedicated to the County.

The Citizens Planning Advisory Committee for San Martin was supportive of the project, but only as a golf course, and not a project that later would be converted to a subdivision. In order to ensure that the golf course remains on this site, the applicant should agree to the dedication of the development rights over the golf course itself to permanent open space so that the use could not be changed in the future.

The question of whether the development rights to the golf course area should be relinquished is a policy decision and therefore is outside the scope of this EIR.

With respect to hydrology, the analysis is good but there is a concern with the berms along Coolidge Avenue having the potential to deflect flood waters to homes to the north unless breaks are provided in the berms.

The berm along Coolidge Avenue would be designed with sufficient breaks such that the direction of sheet flows during major storm events would not be altered relative to existing conditions. The EIR has been revised to clarify this point. (See Section V. TEXT AMENDMENTS.)

With respect to water quality, it is a good idea to use Twin Valley water, which has a high nitrate content, since the water quality would be improved through utilization of the nitrogen.

Comments noted. No response required.

With respect to biological resources, positive things are planned such as the planting of many trees and the creation of new ponds. Since much of the wildlife is nocturnal, it would be desirable to have the developers impose upon themselves limits on nighttime operations, lighting and noise.

No nighttime activities are planned for the golf course or practice area/driving range. Evening activities would be confined to the clubhouse, restaurant and overnight complex. The lighting of the buildings and parking areas would be directed downward so as not to illuminate adjacent areas. Noise generation would be minimal except for occasional weddings when music would be played. These activities would be confined to a small area of the site and would not significantly interfere with wildlife use of the site.

Commissioner Kruse is satisfied with the archaeological and historic resources portions of the EIR.

Comment noted. No response required.

With respect to visual and aesthetic impacts, it is noted that the subdivision would be set back from the edge of the property. From the western site boundary, a very small portion of the maintenance building may be visible from Watsonville Road.

Comment noted. No response required.

Regarding traffic, there is concern that traffic has been understated. Other uses have not been addressed, such as banquets, weddings and other functions, with an inordinate number of people coming to the site.

Occasional functions such as weddings and banquets occur in the evenings or on weekends, when background traffic volumes are lowest. The analysis of traffic impacts focuses on the peak commute periods when the background traffic levels would be highest, and when traffic generated by the project would be highest. Although functions at the clubhouse may attract up to several hundred participants, the resulting traffic impacts would not be significant because of the low ambient traffic levels for those events. For example, the project would generate almost 100 trips during the p.m. peak hour, which would result in no traffic impacts. For large events like weddings, the clubhouse would have capacity for 200 guests. Assuming 2 people per car, 100 trips could be generated before and after such an event. However, since such events would occur on weekends when background traffic levels are low, no traffic impacts would result.

With respect to noise, it is believed that all noise would be contained within the valley. The air quality impacts would be negligible to slightly impaired. Hazardous materials impacts will be avoided if the project complies with the Golf Course Guidelines and the Audubon program. There is no concern with electromagnetic fields.

Comments noted. No response required.

With respect to water supply, there are concerns with potential impacts on neighboring wells. There still needs to be a lot of work done to determine availability of retrievable water supply. The assumptions made by the hydrologists about the water supplies on the site have yet to be confirmed. Assumptions regarding depth of alluvium, transmissivity, and specific yield still need to be tested out. There is a need for test wells and one or more monitoring wells. The calculations made by Geoconsultants regarding how much groundwater is available for withdrawal are probably realistic. However, there should be a formula for less-than-average rainfall years so precautions can be taken to prevent overdraft and subsidence and permanent loss of the aquifer.

Refer to Response J. See also Section II. OVERVIEW OF MAIN ISSUES DISCUSSED IN COMMENTS ON EIR, A. WATER SUPPLY..

Bob Ukestad of the West San Martin Water Works indicated that the golf course would pay the same rate as domestic users. This is of concern because it provides an incentive to rely overly heavily on on-site groundwater, which would be cheaper to obtain.

Since the time of the May 2 Planning Commission hearing, Mr. Ukestad has indicated in writing that any water conveyed to the Lion's Gate project for irrigation purposes would be charged at approximately 35 to 42 percent of the rate for domestic supply. The letter from Mr. Ukestad has been added to Appendix P of the EIR. (See Section VI. REVISIONS TO THE APPENDICES OF THE EIR.)

One of the biggest concerns is with intensity of use and the amount of development on the site itself. There are always plusses and minuses for a project of this size and scope. Most people in the South County who want to see this project never want to see it change, so the developer should relinquish development rights over the golf course itself.

Refer to the response to the first comment above regarding the issue of project intensity and scope. The question of whether development rights to the golf course should be relinquished is a policy decision which is outside the scope of this EIR.

MM. Comments of Brent Ventura, Planning Commissioner

The concerns with agricultural lands is something of a threshold issue, and the EIR should include further analysis of this issue. There are varying figures in the EIR regarding the amount of agricultural land that would be permanently converted to non-agricultural use by this project.

Comment noted. The EIR has been revised to clarify this issue. (See Section V. TEXT AMENDMENTS.)

Where will the 110 acres of vineyard be planted. Do these areas comprise prime soils or something else?

As discussed on pages 18 and 67 of the DEIR, 10 acres of vineyard would be planted along the eastern project frontage along Coolidge Avenue, and 100 acres would be planted at the western end of the site near Watsonville Road. These areas comprise Class II, III and IV soils, and are not designated as "Prime Farmlands." (Note that this mitigation has been revised to include vineyards and/or orchards.)

The other issue is why can't further efforts be made to move the houses and amenities of the project so as to preserve more of the agricultural soils. One of the top goals of the County's General Plan policies and zoning is to preserve agricultural land in the South County. To allow this acreage to be converted based on the argument that it is no longer viable will set a precedent that can be used by applicants in the future, which runs contrary to policy. This issue needs to be further addressed in the environmental document.

The hillside cluster subdivision is planned for the field along Turlock Avenue largely to avoid placing the lots in the interior of the valley, which could involve significant impacts. For example, additional roadways and homesites in the interior of the site would require more piping and crossing of streams, and the internal traffic would result in greater potential mortality to California tiger salamanders and western pond turtles. This alternative would likely necessitate removal of oak woodland and would generally reduce the wildlife habitat value of the site. To provide a full discussion of this scenario, a new project alternative has been added to the EIR. (See Section V. TEXT AMENDMENTS.) The proposal to place the cluster subdivision on the agricultural land is not driven by the fact that the agricultural land was no longer viable, but rather that it represents the least environmental damaging alternative location for the residential lots when all environmental factors are considered. The lack of agricultural viability is not relevant to the siting issue, but rather is the conclusion of the agricultural impact analysis required for the EIR, which was undertaken long after the current project was first proposed and designed.

With respect to open space dedication, further evaluation needs to be undertaken regarding the types of easements to be dedicated and the agencies to which they might be dedicated to.

As required by Policy R-LU 20 of the 1995 County General Plan, an open space or conservation easement would be dedicated over the permanent open space area. (The issue of whether a conservation easement should be required over the golf course area requires a policy decision and is therefore outside the scope of the EIR.) The specific provisions of such easements are to be reviewed by the Planning Commission and county counsel. These are policy and administrative matters which are not required by CEQA to be discussed in EIRs.

Regarding visual and aesthetics, another analysis is requested of what they project will look like on-site and off-site.

The visual aspects of the project are addressed in Section III. J. of the DEIR. As discussed, only the cluster subdivisions and the equestrian center along the eastern site frontage would be visible from off-site public locations. (As noted in the DEIR, there is one private residence with *views over the site from the adjacent ridge to the north.) The potential visual impacts along the eastern site frontage would be mitigated with landscaped frontage berms as shown in the artist's rendering in Figure 16 (Revised). Since no other aspects of the project would be visible from public roadways or inhabited areas, no further illustrations of visual impact are necessary. However, the DEIR does contain site plans for the golf course and the residential areas, as well as renderings of the clubhouse complex (and a floor plan and building elevations of the equestrian center have been added) to provide visual illustrations of these aspects of the project. In addition, a model of the project is currently being constructed.*

With respect to the overnight units, the environmental document should include a discussion regarding the convertability of the overnight units to permanent residential units. What kind of mechanisms can be included to assure that there will not be a problem in this regard?

As shown in the detailed site plan for the clubhouse vicinity (Figure 10a of the DEIR), the cart paths providing access to the overnight units are 10 feet wide, with sharp curves, and have the units clustered closely along the path. With this layout it would be impossible to convert these paths into vehicle access drives that would meet County standards. Thus the possibility of future vehicular access is precluded in the site plan itself. Any future proposal to change the site plan would require an application for a use permit modification which would require a Planning Commission hearing. Any thoughts of converting these units to residential would be futile since a General Pan Amendment would be required, and the General Plan contains no residential categories that could be used for this purpose.

Given the amount of recharge and reuse of water proposed on the site, the EIR did not contain much of a discussion of odors associated with those processes, which should be addressed.

The potential odor impacts associated with the wastewater treatment process are fully addressed on pages 199 and 200 of the DEIR.

Regarding the County's Golf Course Design Guidelines, one of the things being considered that should be addressed is counting the trees that are going to be impacted as trees that are to be removed. However, given the number of trees that are going to be planted, this should not be a significant issue.

A review of the project site plans indicates that as many as 6 trees are located adjacent to proposed roadways. Without more detailed engineering plans for the roadways, the potential for impact is difficult to determine. Even if some of these trees do not survive despite efforts to avoid impacts, the proposed planting of over 2,500 trees on the site would certainly compensate for this loss.

There is a concern for the restoration and creation of habitat, particularly riparian corridors and habitat for turtles, salamanders and avian predators. What habitat is going to be created or restored for them and where on-site will this occur? The model courses at Spanish Bay and Granite Bay have left the environment in better shape than it was before development. It is hinted that these things will occur but the specifics are skimmed over in the DEIR, and should receive further review.

With respect to the habitat restoration for riparian corridors and habitat for California tiger salamanders and western pond turtles, these programs are described in detail in the reports by LSA Associates contained in Appendix F, and are summarized in the text of the DEIR. These programs include detailed restoration plans and monitoring programs. It is not clear which aspects of these programs are believed to have been "skimmed over" in the DEIR.

With respect to "avian predators" such as eagles and other raptors, the DEIR and the biological report by H.T. Harvey and Associates state that the on-site grasslands comprise a small percentage of the overall foraging areas for these birds, and the removal of a portion of the on-site grasslands would not have a significant adverse impact on these species. There are no known raptor nests within the project site or in proximity to the development area, although preconstruction surveys for any newly established nests would be undertaken, with mitigation and avoidance measures taken if any such nests are found.

The EIR addresses growth-inducing aspects of the golf course, but does not speak to the growth inducement resulting from this golf course development, which is beyond just a golf course. The package treatment plant in particular is a non-rural, growth-inducing aspect of this development, and that needs to be addressed.

The growth-inducement discussion in the DEIR, commencing at page 224, addresses not only the growth inducement potential from the golf course complex but also the residential development, as well as the proposed General Plan amendment.

With respect to the package treatment plant, the DEIR at page 225 states: "The wastewater treatment and disposal system proposed for the project would not have any excess capacity beyond what is needed for the project." That is, the treatment capacity would be limited to 30,000 gallons per day, which represents the peak daily flows from the project as proposed. Since all developments rights on the project site would be taken by the project, it is difficult to envision off-site locations for which extension of sewer service would be desirable or practical given the distances from the treatment plant and the low density of Rural Residential development allowed in the vicinity under the General Plan. Even if a treatment plant expansion were to be proposed, the operating permits from the County Department of Environmental Health and the Regional Board would require modification, and the required expansion of the Community Services District would require the approval of LAFCO.

As a practical matter it would be difficult to expand the treatment system once it is installed. All of the components of the package wastewater treatment facility would be sized to serve only the Lion's Gate project. It would be very difficult if not impossible to add to the system at a later date to accommodate additional development. The proposed treatment plant site is in a constrained location with very limited area available for expansion. Additionally, it would not be possible to expand the effluent disposal pond given its location on top of a knoll, and there are no suitable locations for additional ponds nearby. Also, new pipeline would have to be laid and pump stations added. Moreover, it is unclear what the incentive would be to the homeowners association and the country club for tolerating the inconvenience and nuisance of a system expansion that would not benefit them. (See also Section *II. OVERVIEW OF MAIN ISSUES DISCUSSED IN COMMENTS ON DEIR, A. WATER SUPPLY.)*

The EIR should include an analysis of whether or not the development raises the value of surrounding land, and therefore is a growth-inducing driver in that area. Increased land values would make the land more developable, and more interest would be generated for more overnight units in the area.

CEQA does not require EIRs to include analyses of economic impacts, which would include assessments of property values. Thus any discussion of the connection between property values and growth-inducement is outside the scope of the EIR.

With respect to project alternatives, the EIR should incorporate an alternative that would preserve more of the prime agricultural land on the site.

Comment acknowledged. The EIR has been revised to add a new project alternative which avoids impacts to prime agricultural land, as suggested. (See Section V. TEXT AMENDMENTS.)

Regarding riparian corridors, an attempt should be made to eliminate some of the proposed creek crossings, and to keep a minimum 100-foot buffer from any turf, rough or parking areas.

Subsequent to the release of the DEIR, the applicant revised the development plan to eliminate 5 golf cart bridges, leaving 8 cart bridges and 3 roadway bridges in the plan. (See Section V. TEXT AMENDMENTS.)

As discussed on pages 127-8 of the DEIR, the golf course plan conforms with the setback requirements for varying environmental conditions, as established by H.T. Harvey and Associates, a well-qualified ecological consulting firm.

NN. Comments of Tom Tanner, Planning Commissioner

On page 54 of the DEIR there is a discussion of the conformance of the project with Policy SCI-7 which states that urban development shall occur in an orderly and contiguous pattern. The EIR does not address this statement, particularly with regard to the overnight units, which are urban. Likewise, the DEIR does not address Policy SCI-10 which states that urban developments shall only occur in cities.

The finding required in the HS zoning ordinance to determine the appropriateness of the overnight accommodations is that they be "consistent with both the scale of the golf course development and the rural character of the zoning district." The proposed overnight accommodations would be constructed as a series of adobe cottages following the natural contours. Having a low profile with much variation in building plans and rooflines, these units would not appear as a massive hotel but would blend in with the surroundings. The total floor area of the overnight complex would be approximately the same as the clubhouse itself, and thus would be consistent with the scale and character of the clubhouse, which also would be built in the adobe style.

The 45 units of single-story overnight accommodation would comprise approximately 34,000 square feet of floor area. This represents 0.3 percent of the total golf course area, 0.2 percent of the total development area, and 0.05 percent of the total site area. This does not represent urban scale or intensity, or a development that would significantly affect the rural character of the *area, particularly considering that the overnight units would not be visible to the public from off-site locations. It should be noted that the original proposal was for 60 overnight units, which was scaled back to 45 units when the 9-hole academy course was eliminated from the project.*

There is somewhat of a conflict between General Plan Policy R-LU 18(g) and the Hillside zoning ordinance regarding commercial and industrial uses in rural settings. The General Plan policy permits commercial and industrial uses which by their very nature require a rural setting. However, a golf course does not necessarily require a rural setting, and overnight units do not require a rural setting. On the other hand, the Hillside Zoning Ordinance specifically identifies overnight units as being permitted. There seems to be somewhat of an inconsistency between the General Plan and the Hillsdale Zoning Ordinance in this regard.

Refer to the above response.

V. TEXT AMENDMENTS

The following sections of the Draft EIR are amended as noted below. New wording is underlined. Deleted wording is ~~lined out~~.

SUMMARY

B. SUMMARY OF IMPACTS AND MITIGATIONS

B. AGRICULTURE

p.ii Revise Mitigation 1 as follows:

The loss of approximately 110 acres of prime farmland would be offset by the planting of vineyards and/or orchards in areas not proposed for development. ~~and by the fact that the site is not economically viable for cultivation.~~

p.vii Revise Impact 3 as follows:

3. The project would result in the loss of ~~1.7~~ 0.83 acres of riparian vegetation or in the reduction of habitat quality in the riparian zone. **(Potential Significant Impact)**

G. BIOLOGICAL RESOURCES

p.ix Revise Impact 12 as follows:

12. The project would eliminate approximately ~~1.5~~ 1.2 acres of existing wetlands on the site.

H. ARCHAEOLOGY

p.x Revise Mitigation 2b as follows:

b. ~~Any human remains that are discovered shall be removed, the remains shall be analyzed, a report shall be prepared, and if determined to be Native~~

~~American, the remains shall be reburied under the direction of a designated Native American group.~~

In the event that human skeletal remains are encountered, the applicant is required by County Ordinance No. B6-18 to immediately notify the County Medical Examiner/Coroner (299-5137). Upon determination by the County Medical Examiner/Coroner that the remains are Native America, the Coroner shall contact the California Native American Heritage Commission, pursuant to subdivision (c) 7050.5 of the Health and Safety Code, and the County Coordinator of Indian Affairs. NO FURTHER DISTURBANCE OF SITE MAY BE MADE EXCEPT AS AUTHORIZED BY THE COUNTY MEDICAL EXAMINER/CORONER. If artifacts are found on the site, a qualified archaeologist shall be contacted, along with full compliance with section B6-19 of the Santa Clara County Code.

I. PROJECT DESCRIPTION

B. DESCRIPTION OF THE PROPOSED PROJECT

p.14 Replace "Figure 9a" with "Figure 9a (Revised)" on the next page.

p.15 Replace "Figure 9b" with "Figure 9b (Revised) on the second next page.

Permanent Open Space Area

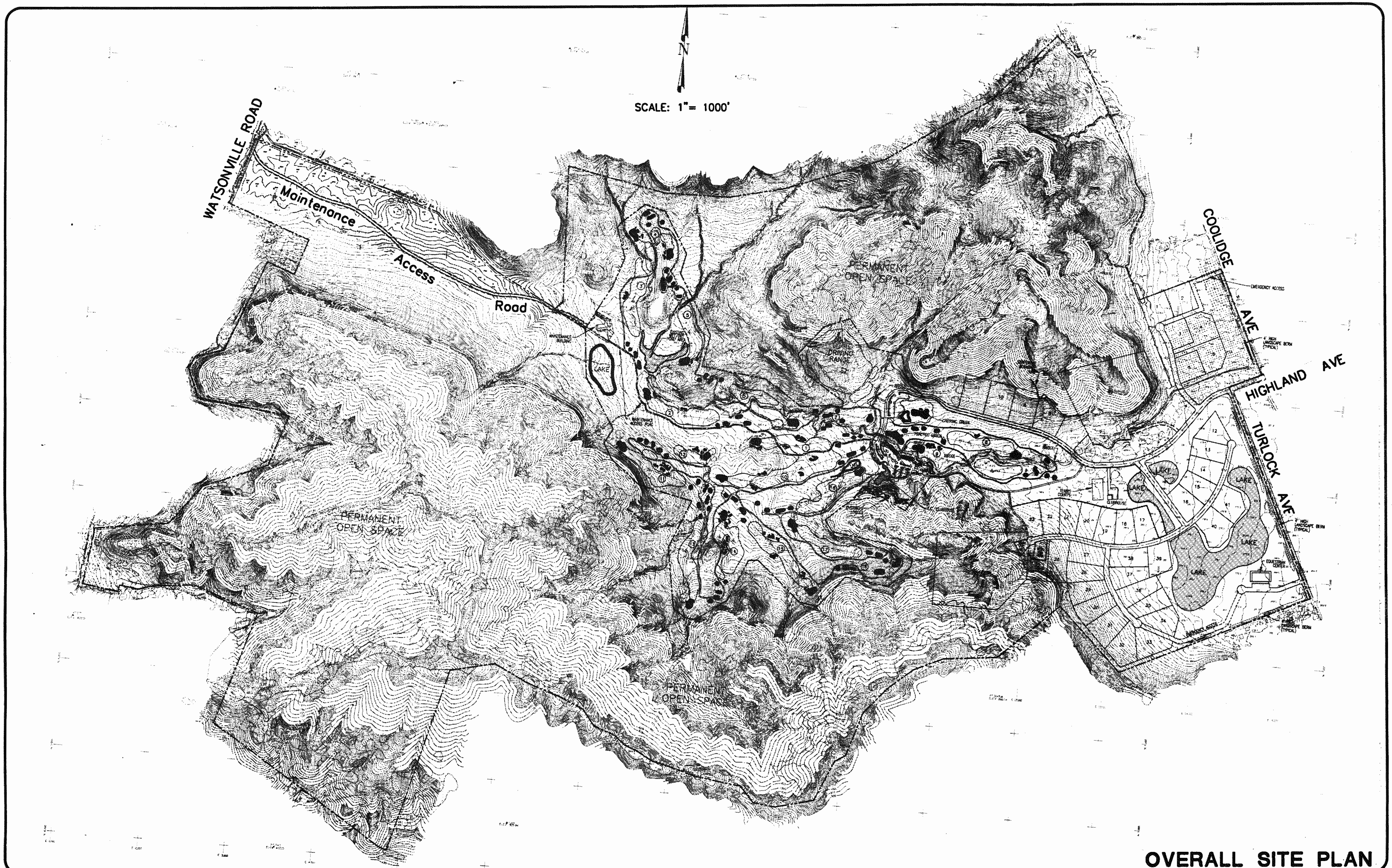
p.18 Revise the paragraph three, sentence one as follows:

> The permanent open space area would also include ~~100~~ 110 acres of vineyard to be planted in two areas.

p.18. Revise the fifth paragraph to add the following:

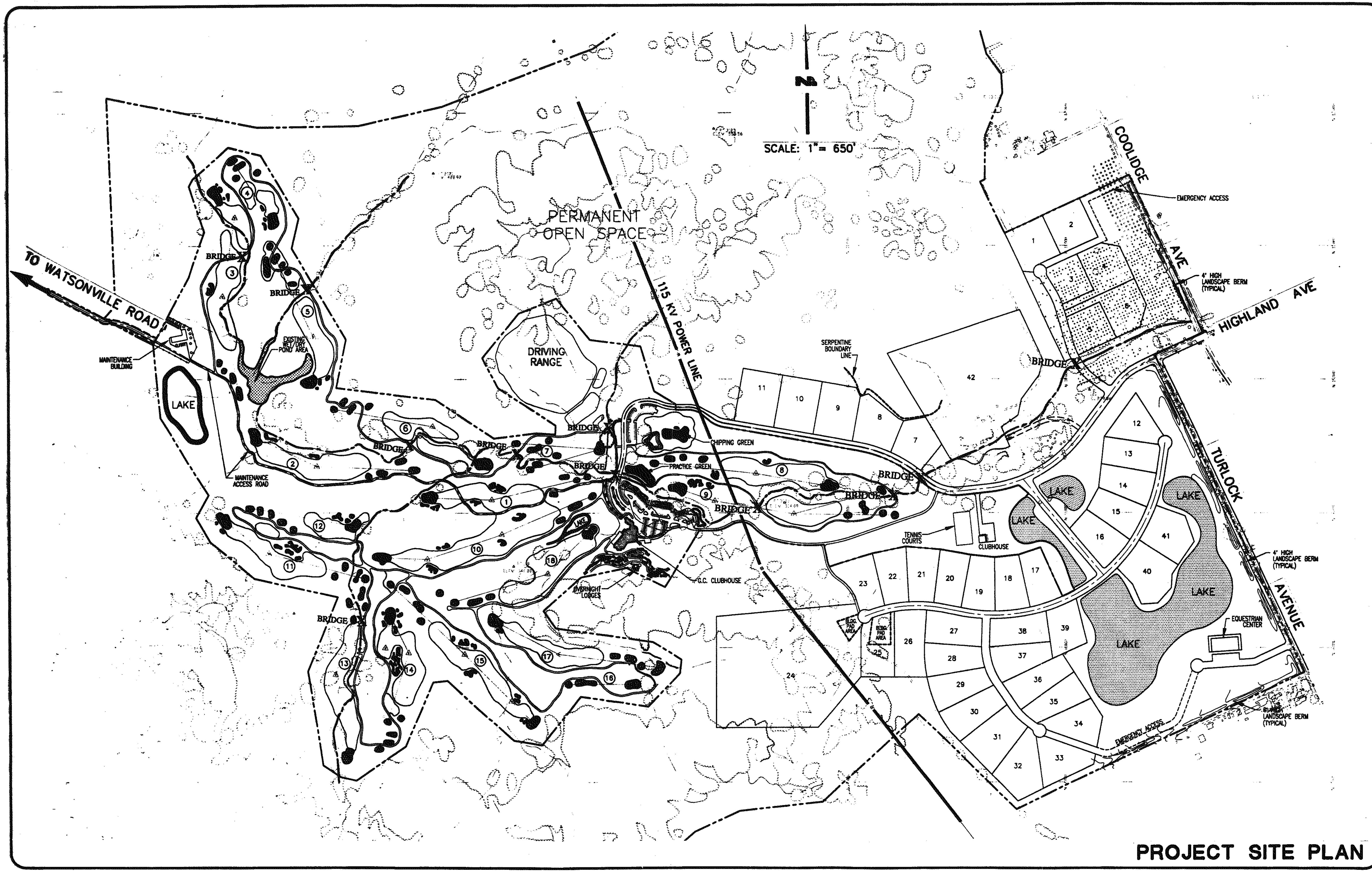
> The permanent open space areas of the site would be placed in the ownership of the homeowners association for the project ~~and~~. In accordance with County requirements, a conservation easement over the open space area would be dedicated to the County, but this open space area would not be open to the general public.

p.21 Replace "Figure 10a" with "Figure 10a (Revised)" on the third next page.



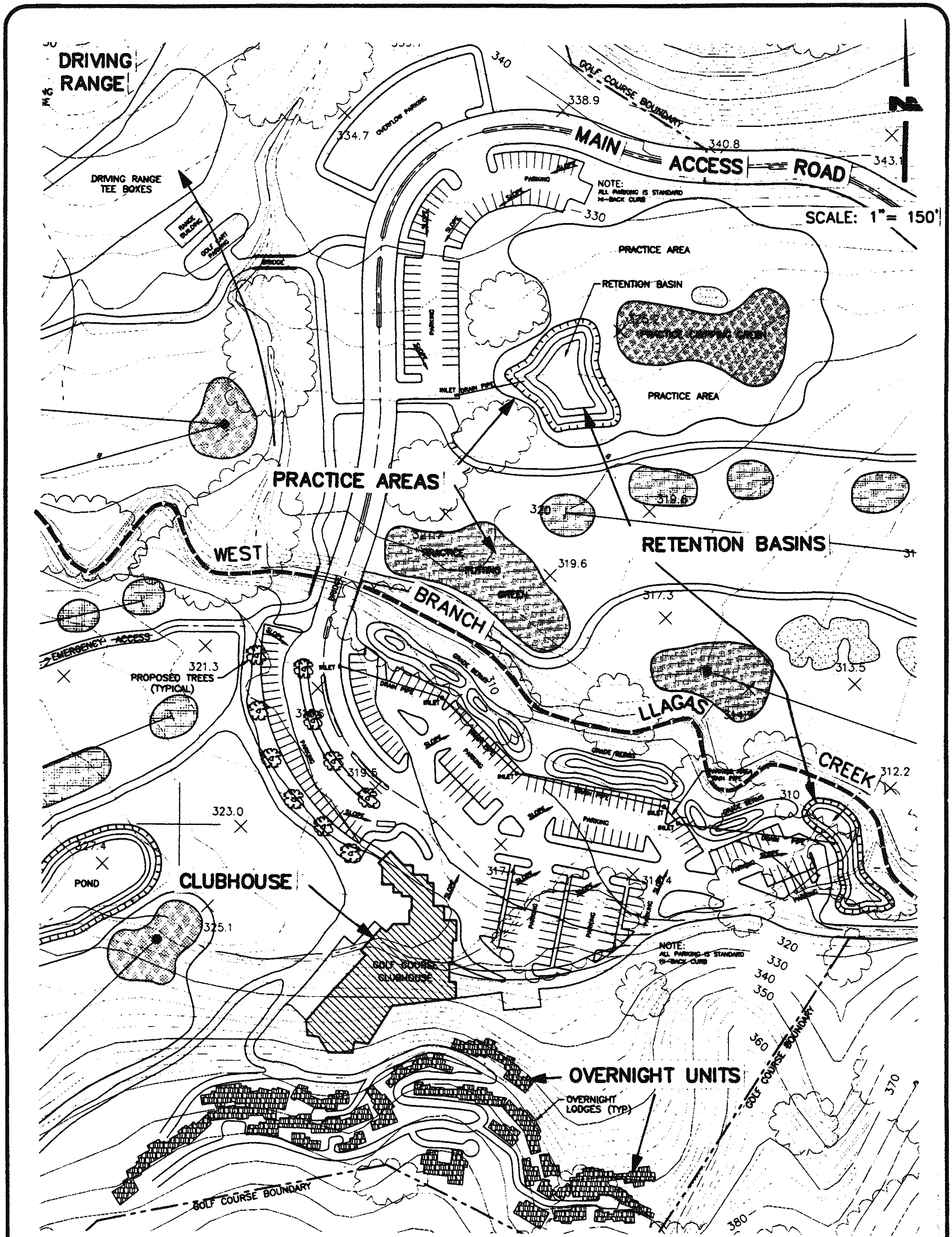
OVERALL SITE PLAN

FIGURE 9a (REVISED)



PROJECT SITE PLAN

FIGURE 9b (REVISED)



SITE PLAN - CLUBHOUSE VICINITY

FIGURE 10a (REVISED)

Equestrian Center

p.24 In the first paragraph, add the following after the first sentence:

(see Figure 9c)

p.24 In the first paragraph, add the following after the fifth sentence:

(see Figure 10c)

p.24 Revise paragraph two, sentence six as allows:

Any proposal to compost manure would require approval from the County Department of Health Solid Waste Unit and the Regional Water Quality Control Board.)

p.24 Insert the new Figure 10c after page 24, as shown on the following page.

Maintenance Facility

p.25 In paragraph one, add the following after the fourth sentence:

The treated water from the system would be recirculated for reuse in equipment washing. The accumulated sludges and other wastewater constituents would be dewatered and dried to a solid state and disposed of at a landfill. The washdown and chemical mixing areas would be covered to prevent rainwater from entering the system.

p.25 In paragraph one, add the following after the last sentence:

...with all stormwater from this area directed to grease traps before being released to the storm drain system.

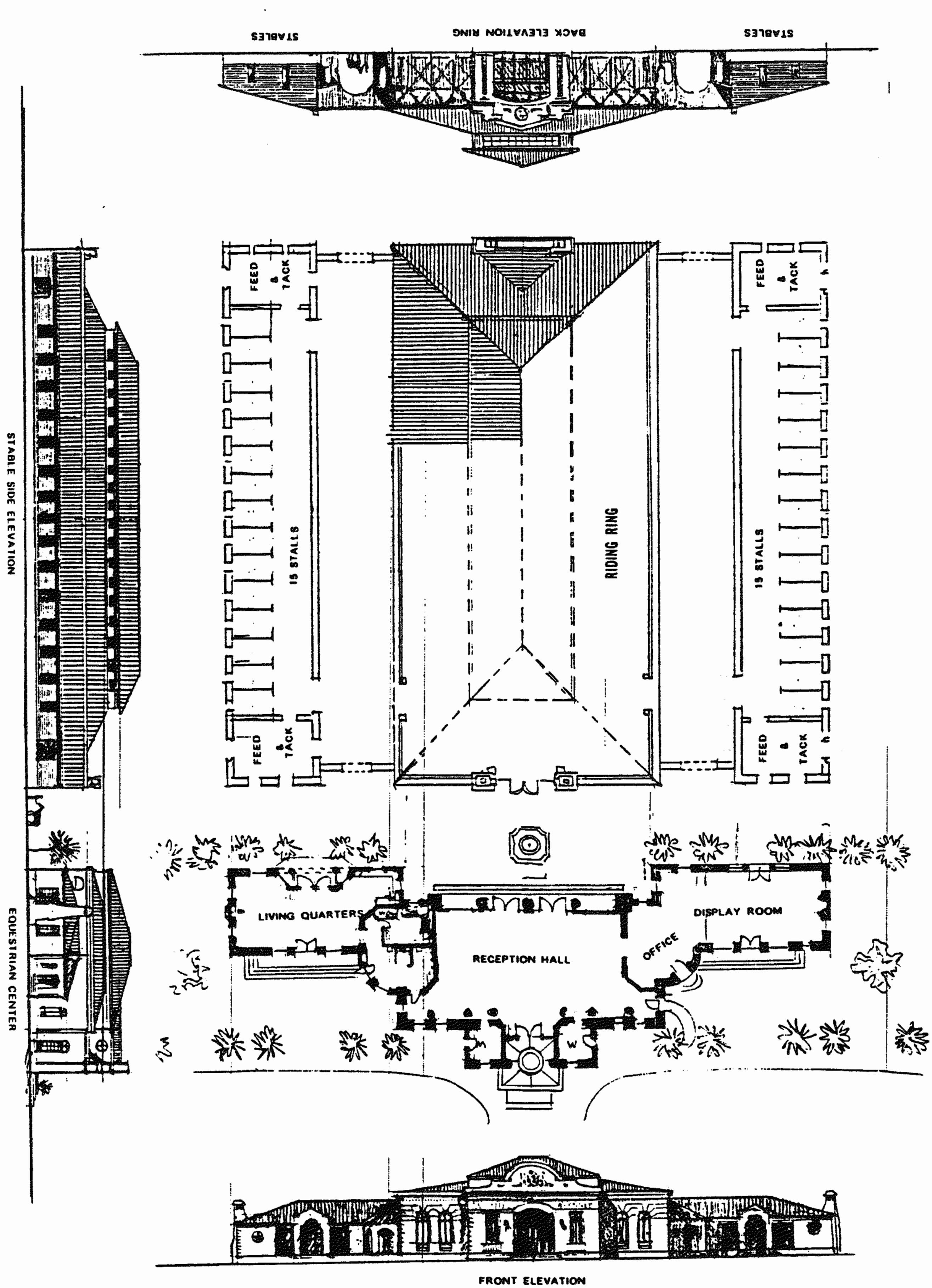
Access and Circulation

p.26 Revise the first paragraph on the page, sentence two as follows:

The cart path system would include ~~6~~ 4 bridges across West Branch Llagas Creek downstream of the existing pond, and an additional ~~7~~ 4 bridges across various tributaries to the main channel.

Drainage

p.27 Revise paragraph one, sentence three as follows:



SCALE: 1" = 50'

EQUESTRIAN CENTER PLAN

Source: Elmore Bohan Design

FIGURE 10c

~~Along the West Branch of Llagas Creek, there are two locations upstream of the clubhouse where small existing meanders would be removed in the golf plan.~~

Golf Course Drainage

p.27 Revise fifth paragraph as follows:

The putting greens would drain through vegetated turf buffers at least 25 feet wide and/or into water quality control basins, ~~dry wells,~~ or ponds. There would be grass-lined swales providing for a minimum of 25 feet of overland flow for filtration of runoff from these subsurface drainage collection areas before discharge. ~~or discharge would be to drywells located at least 25 feet from a wetland or riparian area.~~

Residential Drainage

p.27 Revise the first paragraph as follows:

The drainage from the Rural Residential subdivision located north of Highland Avenue would be conveyed ~~directly to the reach of West Branch Llagas Creek which flows through the southern portion of this area~~ to a small retention basin to be constructed in the northwest portion of this site.

Irrigation System

p.30 Revise the third paragraph as follows:

Irrigation during the rainy season would occur infrequently, perhaps an average of one day per week. Water requirements would be higher during the ~~6~~ 2-month grow-in period, when water would be applied at rates approximately ~~double~~ 10-percent higher than those estimated for the golf course once established

Grow-in would be scheduled for the spring or fall to avoid burning the seeds in the summer and to avoid the risk of washouts during the winter

Fertilization

p.30 In the third paragraph, add the following after the third sentence:

(Sampling for nitrogen would occur quarterly for the first three years, and semi-annually after that.)

Pest Management

p.31 After the fourth paragraph, add the following to the fourth bulleted item:

(See also "Maintenance Facility" above for a description of the washwater treatment and recycling system.)

E. USES OF THIS EIR

p.34 After the fifth item, add the following:

; and Water Quality Certification under Section 401 of the Clean Water Act.

II. CONSISTENCY WITH PLANS, POLICIES AND REGULATIONS

Agriculture

p.44 Revise the second paragraph on the page, sentences two and three as follows:

The proposed development of this parcel of land would result in the loss of approximately ~~100~~ 110 acres of prime farmland. The impact of this loss is reduced by the fact that agricultural cultivation of this site is ~~longer~~ marginally economically feasible at best.

Agriculture and Agriculture Resources

p.50 Revise the second paragraph, sentence two as follows:

The impact of this loss is somewhat reduced by the fact that agricultural production is ~~no longer~~ marginally economically viable on this site at best, and ~~by the fact that the project includes~~ would be mitigated by the planting of 110 acres of vineyards in areas not currently under cultivation.

Other Local Jurisdictions

Local Agency Formation Commission (LAFCO)

p.59 After the first paragraph, add the following new paragraphs:

LAFCO applies two general guidelines and eight policies in decisions involving the formation of special districts such as the Community Services District proposed for the Lion's Gate project. These guidelines and policies are set forth below, with each followed in turn by an analysis of the consistency of the proposed CSD formation with these policies.

A. General Guidelines

1. The proposed formation or incorporation should be based upon a need for services, maintenance of community identity, or controls which can best be provided by the agency proposed and upon the absence of existing alternatives that could provide the service or control in a more efficient manner.

Analysis: A Community Services District (CSD) is needed for the Lion's Gate Reserve project in order to provide for the on-going operation and maintenance of the on-site wastewater collection, treatment and disposal system. The CSD would also provide for the on-going funding of this service through a special assessment to be collected with the *ad valorum* taxes from the golf course operation and the residential property owners. The functions of the CSD may also include maintenance of roadways, storm drains, street lighting and landscaping, and other community services. Due to the multiple property ownerships within the area to be served by the CSD, no other alternative is available to provide the necessary services. The only other possible alternative mechanism is the formation of a County Service Area (CSA), but the County of Santa Clara has formed no such service areas to date, and has no administrative structure in place for the management of such entities.

2. The Commission encourages annexation to an existing city or special district over the incorporation/formation of a new local governmental agency.

   Analysis: The Lion's Gate project is not located adjacent to an incorporated area to which it might be annexed. The nearest city is Morgan Hill, which has its southern boundary approximately one mile north of the Lion's Gate site. The project site also lies outside the Sphere of Influence of the City of Morgan Hill. The site is partially located within the unincorporated community of San Martin, which the County intends to remain unincorporated.

B. Incorporation and Formation Policies

1. A proposed incorporation or formation must satisfy a demonstrated need for services, and promote the health, safety, and welfare of the service community.

   Analysis: The primary reason for forming the CSD is for the operation, maintenance and on-going funding of the package wastewater treatment facility planned for the project. This centralized treatment and disposal system was recommended over the use of conventional septic and leachfield systems by the County Department of Environmental Health and the Regional Water Quality Control Board because it would avoid the water quality impacts associated with conventional leachfields.

2. An area proposed for incorporation must be compact and contiguous, and possess a community identity.

   Analysis: The area proposed to be served by the CSD would comprise a 410-acre contiguous area consisting of golf course facilities and residential development. This "community" would have a distinct identity and boundaries.

3. Any incorporation or formation proposal must define the relationship of the new district to existing agencies, including the County. The Commission will study the fiscal impacts of the proposal on existing agencies.

   Analysis: The CSD would lie partially within and partially adjacent to the unincorporated Community of San Martin in the County of Santa Clara, and would be located approximately one mile south of the southern boundary of the City of Morgan Hill. The

County does not provide sanitary sewer service and there are no other agencies or special districts in the vicinity of the Lion's Gate site that provide sanitary sewer service.

4. A proposed incorporation or formation must not conflict with the normal and logical expansion of adjacent governmental agencies.

   Analysis: The Lion's Gate site is outside the Sphere of Influence of the City of Morgan Hill. There are no other governmental agencies in the vicinity which could expand into the project area.

5. Applications to create new agencies, or to reorganize existing agencies, to provide urban level services on a neighborhood or community-wide scale, shall include a proponent-prepared feasibility study incorporating the following five elements:

   a. Inventory of presently received local governmental services.

   b. Roster of agencies that provide present services.

   c. Determination of desired changes in governmental services, both in type and area served. The "area" concept will be considered both from the standpoint of efficient service territory, and for determining the level of environmental review necessary, pursuant to the California Environmental Quality Act (CEQA).

   d. Proposal for a reorganization or formation which accomplishes the objectives set forth in 5c. The feasibility study shall address issues and factors of consideration specified in Government Code Sections 56425 (Sphere of Influence issues), 56653 (plan for services), and 56841 (factors to be considered in review of a proposal).

   The study shall also consider appropriate alternatives which may include, but not be limited to:

      (1) Continuing the status quo;

      (2) Establishing a Municipal Advisory Council;

      (3) Forming a County Service Area;

      (4) Consolidating existing special districts within a Community Services District;

      (5) Annexing to an existing city;

      (6) Incorporating a new city.

   e. Financial feasibility component consisting of projected revenues and expenditures that would result from implementing the proposal.

   Analysis: The required feasibility study would be prepared in conjunction with the application to form the Community Services District.

6. The purpose of requiring the feasibility study at the outset of preparation is to enhance proponents efforts to:

   a. Design a proposal to satisfy their requirements;

   b. Communicate persuasively with the community when soliciting petition signatures; and

   c. Present their proposal effectively when seeking LAFCO approval.

   Analysis: The required feasibility study would be prepared subsequently, as noted under item 5.

7. LAFCO will review feasibility studies critically and consider consequences from a broader perspective than would be expected of proposal advocates.

   Analysis: See item 6, above.

8. For proposals affecting whole communities, LAFCO finds applications by voter petition generally preferable to applications by agency-adopted resolution, in that participation of persons representing the full range of the community spectrum should be assured.

   Analysis: Not applicable.

III. ENVIRONMENTAL SETTING, IMPACTS AND MITIGATION MEASURES

B. AGRICULTURE

Environmental Setting

p.65 In the last paragraph on the page, revise the fourth sentence as follows:

> In addition, an area of approximately 300 acres ~~of Class II and III soils,~~ running along the length of the valley floor to Watsonville Road, ~~are~~ is designated as "Additional Farmland of Local Importance" on the 1992 update on the Important Farmlands Map (this area consists of Class III soils and the remaining portion of the Class II soils discussed above).

Impacts and Mitigation

p.66 Revise "Impact 1" as follows:

> **The development of the site would result in the loss of approximately 180 acres of the 220 acres of the Class II soils on the site,...**

p.67 After the first paragraph, add the following new paragraph:

In a supplement to the economic study, Dr. Niles undertook an analysis of a possible vineyard operation on the Hayes Valley site. The analysis considered a hypothetical 400 acres of vineyard on the site. Based on current yields and prices, the analysis concluded that it would take at least 10 years before such an operation would reach a break-even position. This is due to the extremely high start-up costs for vineyards, which would total almost $6 million (not including land costs) before the first harvest in the third year of operation. While a vineyard would ultimately be profitable, the conclusion reached was that such an operation would not be financially justified given the projected returns, the opportunity cost of capital and the risk of the operation.

p.67 Revise the second paragraph as follows:

Therefore, although the loss of prime farmland resulting from this project represents a potential significant impact, the severity of the impact is ~~reduced~~ moderated by the fact that this land is ~~no longer~~ marginally economically viable for agriculture at best.

Mitigation 1

p.67 Revise the first and second paragraphs as follows:

The loss of approximately 110 acres of prime farmland would be offset by the planting of vineyards and/or orchards in areas not proposed for development.

As noted under "Project Description," 10 acres of vineyard or orchard would be planted along the eastern project frontage on Coolidge Avenue. Additionally, approximately 100 acres of vineyard and/or orchard would be planted in the field at the western end of the project along Watsonville Road. The planting of the vineyards and/or orchards, ~~combined with the fact that agricultural cultivation of this property is not economically viable~~, as discussed above, would ~~reduce~~ moderate the impact of the loss of agricultural land to non-significant levels.

C. PARKS, RECREATION AND OPEN SPACE

Impact 1.

p.71 Revise the second paragraph, fourth sentence as follows:

The Hayes Valley site was ~~identified as a low priority (~~rated #26 of 42~~)~~ sites for open space preservation, placing it in the mid-range of priority for open space acquisition by the County's Open Space 2020 Task Force.

D. GEOLOGY AND SOILS

Impact 10.

p. 84 Revise fifth paragraph as follows:

As discussed in Section *III. P. Water Supply*, ~~on-site wells would be used to augment irrigation water supplies from Twin Valley, Inc~~. ~~However~~, on-site groundwater pumping for irrigation water supply would not exceed the estimated safe yield of 280,000 gallons per day based on average daily use.

E. HYDROLOGY AND DRAINAGE

Mitigation 2.

p.93 Add the following to the first paragraph:

In addition, the frontage berms proposed along Coolidge and Turlock Avenues would include sufficient breaks within the flood-prone sections such that the direction of sheet flows during major storm events would not be altered relative to existing conditions.

F. WATER QUALITY

Mitigation 1.

p.97 In the first full paragraph on the page, revise the third sentence as follows:

In addition, implementation of the Storm Water Pollution Prevention Plan for the project would be subject to inspection by the Regional Water Quality Control Board and/or the State Water Resources Control Board. The Santa Clara Valley Water District may inspect construction activities within or adjacent to a waterway.

Mitigation 3.

p.97 Add the following to the first paragraph:

In addition, floatables/settleables traps would be installed at the parking lot collection points to separate out some contaminants before the runoff enters the retention basins, thereby reducing the amount of contaminants entering the retention basins. These traps would be inspected and cleaned periodically.

p.98 Revise the first paragraph as follows:

At the maintenance facility, ~~the adjacent paved areas would be surrounded by a 6-inch curb, with all rainwater, wash water, lubricants and other pollutants draining to~~ washwater from the equipment washing area, and drainage from the chemical mixing area would be conveyed to an advanced water filtering and recycling system. The treated water from the system would be recirculated for reuse in equipment washing. The accumulated sludges and other wastewater constituents would be dewatered and dried to a solid state and disposed of at a landfill. The washdown and chemical mixing areas would be covered to prevent rainwater from entering the system. The adjacent paved areas around the maintenance building would be surrounded by a 6-inch curb, with all stormwater from this area directed to grease traps before being released to the storm drain system.

G. BIOLOGICAL RESOURCES

Impact 3.

p.125 Revise the impact statement as follows:

The project would result in the loss of 0.83 acres of riparian vegetation or in the reduction of habitat quality in the riparian zone. (Potential Significant Impact)

p.125 Revise the third paragraph, third sentence as follows:

Approximately ~~1.7~~ 0.83 acres of riparian vegetation would be removed, of which ~~0.4~~ 0.33 acres would become "non-riparian" due either to diversion or filling of channels.

p.126 Replace "Figure 15" with "Figure 15 (Revised) on the next page.

p.127 Revise the third full paragraph (item 'c') second, third and fourth sentences as follows:

Lost acreage would be replaced at a ratio of ~~1:1 to 2:1 depending on the value of the riparian habitat removed~~ 3:1. ~~A portion of the 1.7 acres to be removed would also constitute wetlands under the jurisdiction of the U.S. Army Corps of Engineers and would be replaced by the wetland replacement mitigation identified under Mitigation 12 below.~~ The 2.5 acres of riparian restoration area along the main creek channel would compensate for the ~~remaining non-wetland~~ riparian habitat to be removed ~~as a result of the project~~ at a 3:1 ratio.

p.127 Revise the fourth full paragraph (item 'd'), second sentence as follows:

The project proponent would apply for and obtain a Streambed Alteration Agreement from CDFG, a Section 404 permit from the Corps of Engineers, and Section 401 Water Quality Certification from the Regional Water Quantity Control Board

p.128 Revise paragraph one, sentence three as follows:

In areas ~~that do not support canopy~~ where canopy is absent for a distance of at least 100 feet...

Impact 12

p.135 Revise the first three paragraphs of impact discussion as follows:

The project would eliminate approximately ~~1.5~~ 1.2 acres of existing wetlands on the site. (Potential Significant Impact)

Potential impacts to wetlands include direct modifications to creek channels and seasonal wetlands to accommodate fairways, roadways and golf cart path crossings, and to modify the existing pond.

The development of the project would result in the loss of approximately ~~1.3~~ 1.0 acres of wetland under the jurisdiction of the U.S. Army Corps of Engineers, and an additional 0.2 acres of emergent vegetation along existing ponds. The grading and filling of seasonal stream courses for golf fairways and roadway and golf cart crossings would remove approximately 0.7 acres of watercourses. The excavation of the main stock pond would remove approximately 0.3 acres of these wetlands plus 0.2 acres of surrounding emergent vegetation, although these areas would be converted to storage pond. ~~Approximately~~ The 0.3 acres of ~~the~~ seasonal wetlands in the western portion of the property would ~~be filled for~~ avoided by the construction of the maintenance access road to Watsonville Road.

H. ARCHAEOLOGY

Mitigation 2(b).

p.141 Revise the mitigation statement as follows:

~~Any human remains that are discovered shall be removed, the remains shall be analyzed, a report shall be prepared, and if determined to be Native American, the remains shall be reburied under the direction of a designated Native American group.~~

In the event that human skeletal remains are encountered, the applicant is required by County Ordinance No. B6-18 to immediately notify the County Medical Examiner/Coroner (299-5137). Upon determination by the County Medical Examiner/Coroner that the remains are Native American, the Coroner shall contact the California Native American Heritage Commission, pursuant to subdivision (c) 7050.5 of the Health and Safety Code, and the County Coordinator of Indian Affairs. NO FURTHER DISTURBANCE OF SITE MAY BE MADE EXCEPT AS AUTHORIZED BY THE COUNTY MEDICAL EXAMINER/CORONER. If artifacts are found on the site, a qualified archaeologist shall be contacted, along with full compliance with section B6-19 of the Santa Clara County Code.

J. VISUAL AND AESTHETICS

p.147 Replace "Figure 16" with "Figure 16 (Revised)," on the next page.

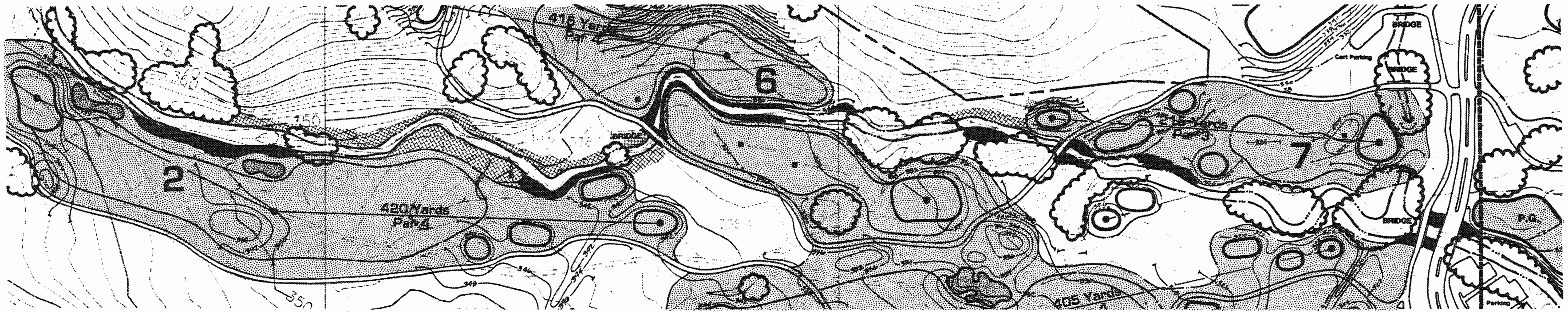
p.135 Revise the fifth paragraph as follows:

Based on the preliminary estimate of ~~1.5~~ 1.2 acres of wetlands affected by the project, it appears that the project may qualify for a General or Nationwide Permit from the Corps.

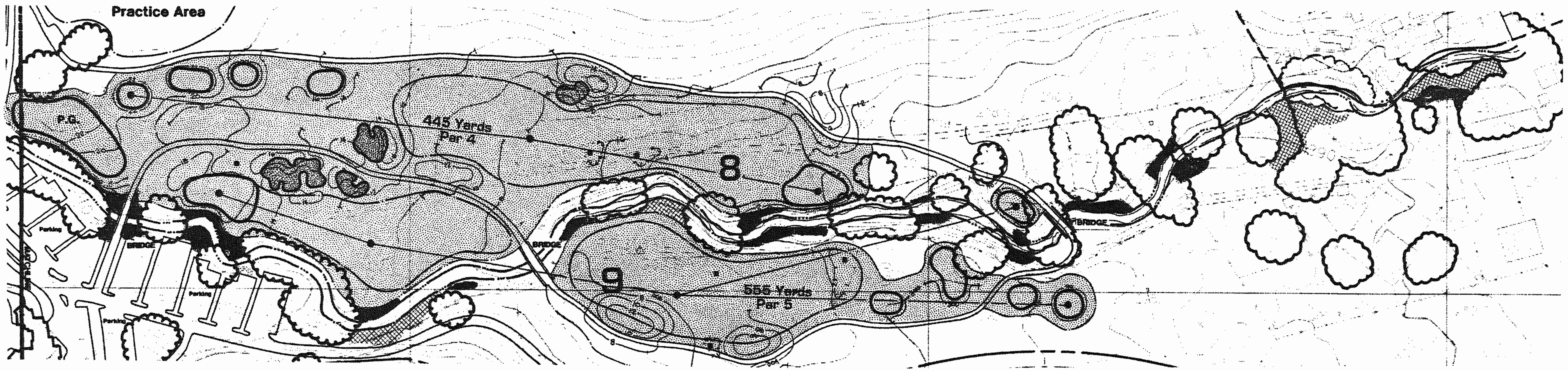
K. TRAFFIC AND CIRCULATION

Background Traffic - Existing plus Approved Projects

p.153 Revise the first paragraph, last sentence as follows:



WESTERN HALF



EASTERN HALF

Location of Tree and Shrub Planting Areas

Trees

Turf and Rough

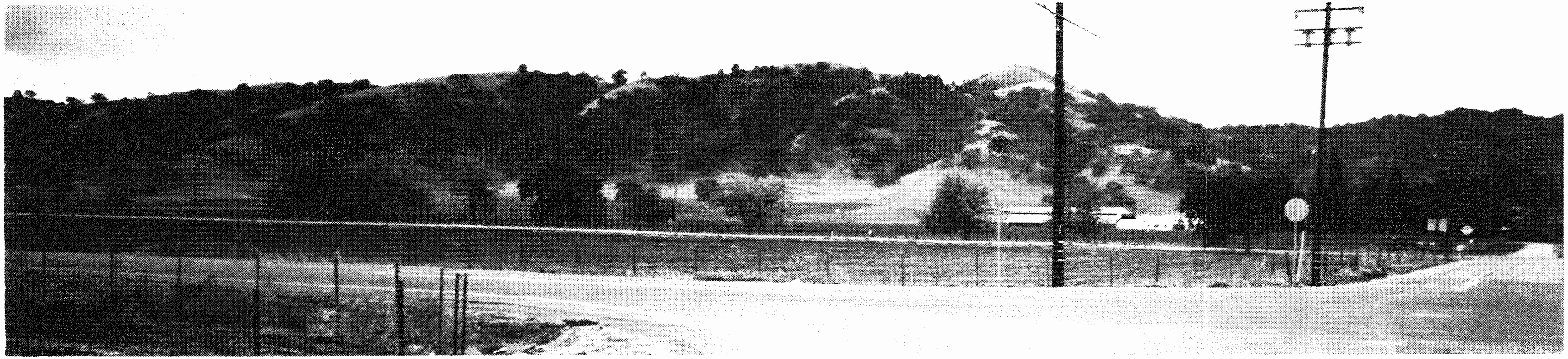
Shrubs

SCALE: 1"= 200'

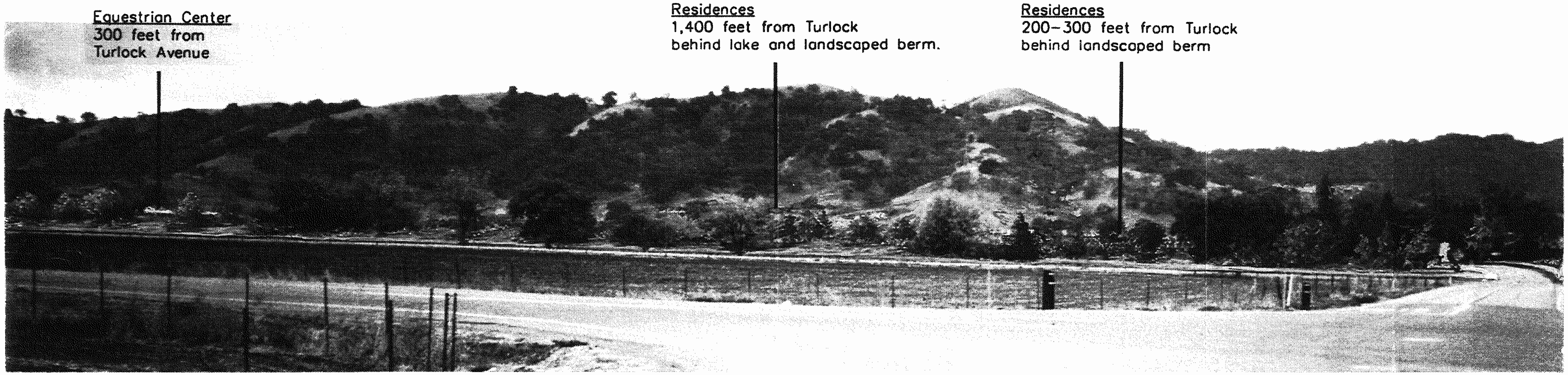
RIPARIAN HABITAT RESTORATION AND ENHANCEMENT CONCEPT

Source: LSA Associates

FIGURE 15 (REVISED)



EXISTING VIEW INTO SITE FROM HIGHLAND / SANTA TERESA INTERSECTION



VIEW WITH PROJECT SUPERIMPOSED

ARTIST'S RENDERING

Prepared by Elmore Bohan Design

FIGURE 16 (REVISED)

Appendix H of this EIR contains a table of these approved projects (Table II), and a figure showing their locations (Figure 3). ~~are contained in Appendix G of this EIR~~

Mitigation 1

p.161 Revise the second paragraph on the page as follows:

> Prior to project approval, a drainage plan, which includes calculations prepared by a registered civil engineer...

N. HAZARDOUS MATERIALS, PUBLIC HEALTH AND SAFETY

Impacts and Mitigation

Mitigation 1.

p. 177 Add the following to the second paragraph:

> In addition, any removal of the existing above-ground fuel storage tanks would require a permit issued by the Hazardous Materials Compliance Division (HMCD). The tanks may not be moved, even for reuse on the site, without HMCD authorization.

IV. CUMULATIVE IMPACTS

p. 212 Revise the third paragraph as follows:

> In terms of land use, the character of ~~this~~ the Morgan Hill - San Martin area is essentially a mixture of urban (or suburban) and rural uses. Therefore, the 16 projects proposed (including the Lion's Gate project) do not represent a fundamental change in the character of the area, individually or collectively, but are incremental additions to the ongoing gradual shift from a rural agricultural to a more ~~urban~~ suburban and rural residential character. (In the immediate vicinity of the Lion's Gate site, this transition has been more of a shift from rural agricultural to rural residential land uses.)

V. ALTERNATIVES TO THE PROPOSED PROJECT

p.219 After the discussion of Alternative D. LOWER DENSITY ALTERNATIVE, add the following paragraphs:

E. AGRICULTURAL PRESERVATION ALTERNATIVE

> This alternative reflects a project designed to avoid development of the 110 acres of "Prime Farmland" in the eastern portion of the project site, along Turlock Avenue south of Highland Avenue. This would mean that the 30 residential lots, the 20-acre lake and the equestrian center would not be built in this area. Since this area is currently designated "Agriculture - Medium Scale" in the County General Plan, this alternative assumes a General Plan amendment to

"Hillsides" so that the residential density from this area could be clustered in the interior of the valley. This alternative would require a substantial redesign of the project to accommodate the golf course, the detention storage lake and the residential component within the interior of the valley.

In terms of land use, this alternative would result in an inefficient development pattern with lots dispersed around the golf course. This would also necessitate extensive and costly extension of roadways and infrastructure to serve the scattered residences. As a result, the amount of permanent open space would likely be reduced to accommodate the inefficient development pattern. Since the proposed project contains 282 excess acres of permanent open space beyond that required under the Cluster Ordinance, this should not affect the number of lots permitted under this alternative.

Although this alternative would preserve the existing field west of Turlock Avenue, it is uncertain whether this field would actually be put to agricultural production. As discussed in DEIR Section *III. B. AGRICULTURE*, the start-up costs involved in a new farming operation here would make such an operation marginally economically viable at best, even assuming the most favorable conditions for property taxes and long-term debt. However, this alternative would result in no physical impact to the prime farmland of the site.

Geologically, this alternative would result in a greater level of potential impacts than the proposed project. The 30 dwellings to be moved into the valley and the access road for those lots would be constructed along the hillsides adjacent to the golf course. These areas pose slope stability concerns and are subject to landslides and debris flows from the adjacent hillsides. While these potential impacts could be mitigated, they would be largely avoided in the proposed project.

The potential flooding impacts would be greater for this alternative than for the proposed project. This is because the additional length of roadway needed for access to the dispersed residential lots would increase the overall impervious coverage and thus increase the runoff generated at the site. However, assuming that the flood detention basin or lake could be relocated outside the area of prime farmland and increased in size to accommodate the additional peak flows, these flooding impacts could be mitigated, as they are in the proposed project.

Biologically, this alternative would likely result in greater impacts to special-status species and wetlands than the proposed project. The additional roadways and residential lots in the interior of the site would likely require more filling or piping of streams, and the internal traffic would result in greater potential mortality to California tiger salamanders and western pond turtles. It would also result in greater loss of upland habitat for the tiger salamander and pond turtle. Construction of homesites and the access road along the foot of the southern hillside would also necessitate removal of oak woodland in this area, an impact not associated with the proposed project. Additionally, the introduction of dispersed residential uses into the interior of the site would reduce the general value of the site for wildlife habitat. The presence of human activity, particularly at night when many species are active, would exclude wildlife species which are not adapted to the built environment. In comparison, the proposed project would only involve nighttime activity at the clubhouse and overnight complex, thus confining the human activity to a relatively small area.

Potential impacts to cultural resources would be slightly greater under this alternative, because the greater coverage of the site by development would increase the chances of disturbance to previously undiscovered cultural resource sites.

The potential visual impacts of this alternative would be less than the proposed project, since almost the entire development would be confined to the interior valley and largely out-of-sight.

Although visual impacts are mitigated in the proposed project by a landscaped frontage berm, the presence of the development would be more apparent.

The traffic generated by the alternative would be the same as the proposed project since they would have the same number of dwelling units. However, under this alternative, the internal access road would likely be connected to Watsonville Road to provide through circulation across the site. This would likely result in a greater use of Watsonville Road to gain access to the golf course as well. However, the impacts of such increased traffic along the Watsonville Road would not be significant.

The noise and air quality impacts of this alternative would be similar to those associated with the proposed project, mainly because traffic generation would be about the same. The change in project configuration would not result in new noise or air quality impacts. The clustering of residential uses around the golf course would expose more of the proposed residences to mower noise, but this condition would presumably be accepted by buyers prior to purchase of the residential properties.

The potential exposure to hazardous materials and electromagnetic fields would be the same under the alternative and the proposed project, since the potential impacts would be fully mitigated or readily avoided in both cases.

The demand for water supply, wastewater treatment, utilities and public services would be the same under the alternative and the proposed project, except that the alternative would require longer extensions of pipeline and utility lines to reach the dispersed residences. Likewise, response times for emergency services would be longer for the dwellings located in the interior of the valley.

In summary, the Agricultural Preservation Alternative would result in lower levels of impact in terms of agricultural land conversion and visual impacts, but would result in greater impacts in terms of geologic hazards, cultural resources and particularly biological resources than the proposed project. Thus, although this alternative would achieve the policy objective of agricultural land preservation, in other respects it would not represent an environmentally preferable alternative to the proposed project.

F. NO GOLF COURSE ALTERNATIVE

This alternative would be similar to the proposed project except that it would not include the golf course component. Thus the 263 acres of the golf course would be included in the Hillside cluster area, which would result in an additional 13 lots, for a total of 54 lots. It is assumed that these additional lots would be developed within the area proposed for the golf course, and that all other aspects of this alternative would be the same as the proposed project.

In terms of land use, this alternative would be no more or less compatible with adjacent uses than the proposed project, with no difference in impacts.
In terms of agricultural land conversion, this alternative would have essentially the same footprint as the proposed project, with no difference in impacts.

Geologically, this alternative would encounter the same concerns as the proposed project; however, all potential impacts could be mitigated or avoided in both cases.

Potential flooding impacts would be approximately the same for this alternative as for the proposed project. The impervious surface coverage by the 13 additional dwellings and the more extensive roadway required would be about the same or slightly greater than the coverage of the golf course facilities. Although the residential alternative would not include the absorbent turgrass and retention basins of the golf course, sufficient land area would exist to create additional detention facilities for the increased peak runoff from added residential lots if needed.

In terms of water quality, this alternative could result in greater impacts than the proposed project. Without the golf course component, a package treatment plant would not be justified, necessitating individual septic and leachfield systems for each residential lot. The potential for groundwater contamination from such individual leachfields would be significantly greater than for the proposed package treatment plant. Although the elimination of the golf course would remove the threat of water contamination from pesticides and fertilizers, in fact this risk would be avoided in the proposed project by the comprehensive environmental management plan and water quality monitoring program which would ensure that water quality impacts would not occur.

Biologically, this alternative would result in approximately the same overall impacts as the proposed project. It is assumed that the 13 additional residential lots could be clustered to avoid impacts to the habitat of the California tiger salamander and the western pond turtle, and would result in lower levels of impact to wetlands and riparian habitat. However, these impacts would be mitigated in the proposed project. Additionally, the introduction of dispersed residential uses into the interior of the site would reduce the general value of the site for wildlife habitat. The presence of human activity, particularly at night when many species are active, would exclude wildlife species which are not adapted to the built environment. In comparison, the proposed project would only involve nighttime activity at the clubhouse and overnight complex, thus confining the human activity to a relatively small area.

In terms of cultural resources and visual impacts, there would be no difference in impacts between this alternative and the proposed project.

The traffic generated by this alternative would be somewhat lower than the proposed project. However, no significant impacts would occur in either case. The corresponding reductions in noise and air emissions would likewise not be significant.

The potential exposure to hazardous materials and electromagnetic fields would be the same under the alternative and the proposed project, since the potential impacts would be fully mitigated or readily avoided in both cases.

The water consumption associated with this alternative would be substantially less than the proposed project, since no golf course irrigation would be involved. However, any potential impacts associated with water consumption in the proposed project would be avoided.

In summary, the No Golf Course Alternative would result in similar levels of potential impact to the proposed project, except that the alternative would likely result in greater water quality impacts, and would involve substantially less water consumption. As such, this alternative would not represent a clearly environmentally superior alternative to the proposed project.

p.219 Revise the second section heading on the page as follows:

~~E.~~G. ALTERNATIVE PROJECT LOCATION

P.222 Revise the second paragraph as follows:

~~F.~~H. SUMMARY - ENVIRONMENTALLY SUPERIOR ALTERNATIVE

Of the 5 7 project alternatives considered above, ~~all but 2~~ 3 alternatives would result in generally greater levels of impact, and 4 alternatives would result in generally the same levels of impact ~~than~~ as the proposed project. ~~as proposed.~~ The alternatives with greater impacts include the No General Plan Amendment Alternative, the Higher Density Residential Alternative and the Alternative Project Location in Coyote Valley. Of the remaining ~~two~~ four alternatives, the Lower Residential Density Alternative, the Agricultural Preservation Alternative and the No Golf Course Alternative would result in slightly lower levels or impact in some categories, but the differences would not be substantial...

VI. REVISIONS TO THE APPENDICES OF THE DEIR

APPENDIX B

Add the following addendum letter from Dr. James A. Niles (see next page).

RECEIVED
MAY 25 1996
NOLTE and ASSOCIATES
SAN JOSE

May 23, 1996

Mr. Bert Verrips
Nolte & Associates
60 South Market Street
San Jose, CA 95113

Dear Mr. Verrips,

RE: Economic Analysis of Agricultural Operations--addendum
Lion's Gate Reserve EIR

Clarification of Modeling Analysis

It is unrealistic to assume that new agricultural enterprises could be undertaken without incurring new debt. The assumption made in the analysis was that the operation started as a family operation free of any long term debt (ie. no mortgage on the property). However, financing would be needed and capital costs were included to finance the startup of new enterprises to include the developmental expenditures such as the costs of land preparation, cost of trees, cost of planting. Included was the carrying cost of the operation until positive cash flow could be generated, reflecting the time lag from planting until harvesting. Existing operations free of any debt are in a completely different position from startup activities. Therefore, the mentioned walnut farm in the San Joaquin Valley which is free from any debt can be profitable while a new walnut operation on the subject property would not be economically viable.

Analysis of Vineyard Alternatives

The supply and demand situation for wine grapes is very favorable at this point in time, suggesting that vineyard might be an alternative to be considered. Table 1 shows salient grape statistics for Santa Clara County since 1970. Harvested acreage has declined from approximately 2500 acres to 1500 acres. Average price per ton has shown an upward trend during the period with considerable variations in yield. The 1970-1974

Table 1. Grape Statistics for Santa Clara County, 1970-1994.

YEAR	HARVESTED ACREAGE	TONS PER ACRE	TOTAL PRODUCTION	PRICE PER TON	TOTAL VALUE
1970	2603	3.65	9,500	$240	$2,280,000
1971	2500	4.64	11,600	$330	$3,828,000
1972	2650	3.71	9,800	$500	$4,900,000
1973	2405	5.36	12,900	$500	$6,450,000
1974	2390	3.56	8,500	$220	$1,870,000
1975	2334	3.33	7,770	$205	$1,593,000
1976	2155	3.30	7,110	$215	$1,529,000
1977	2186	2.46	5,380	$425	$2,286,000
1978	2072	2.66	5,510	$535	$2,948,000
1979	2010	3.00	6,030	$455	$2,744,000
1980	1716	3.00	5,150	$460	$2,369,000
1981	1423	2.25	3,200	$485	$1,552,000
1982	1732	3.00	5,195	$400	$2,078,000
1983	1645	2.00	3,290	$350	$1,152,000
1984	1560	2.50	3,900	$300	$1,170,000
1985	1525	3.00	4,575	$310	$1,418,000
1986	1600	3.00	4,800	$400	$1,920,000
1987	1570	2.00	3,140	$415	$1,303,000
1988	1500	2.50	3,750	$500	$1,875,000
1989	1500	2.75	4,125	$525	$2,166,000
1990	1550	2.50	3,875	$555	$2,151,000
1991	1475	2.50	3,688	$570	$2,102,000
1992	1430	2.50	3,575	$690	$2,467,000
1993	1455	2.75	4,001	$665	$2,661,000
1994	1535	2.50	3,838	$760	$2,917,000

Source: County of Santa Clara, Santa Clara County Agriculture Report, Various reports, 1971-1994, Department of Agriculture.

average yield was 4.18 ton per acre versus a 1990-1994 average yield of 2.55 tons per acre.

Vineyard Alternative

A ten year time horizon analysis of a vineyard was completed to evaluate the proposal of planting a vineyard on the subject property. Key assumptions were:

400 acres of vineyard planted
8' X 6' spacing = 908 vines per acre
Trellis system with drip irrigation
Projected yield of 3 tons per acre in year 3, 5 tons per acre thereafter
Cultural and harvesting costs of $2,000/acre/year

Industry sources supported a projected price of $800 per ton over the 10 year period. The supply and demand situation is currently very tight, but the present high prices are not expected to be sustained over the 10 year time horizon. Wine analyst Jon Fredrikson, president of Gomberg, Fredrikson and Associates of San Francisco, commenting at a recent presentation in Visalia, pointed out the tremendous expansion of wine grape vineyards in the state and the effect on damping price prospects. "Knowing growers, we are likely to produce more grapes than we could possible use by 2000. Nevertheless, I am bullish on demand, and I hope demand will keep pace with all the grapes being planted."

The analysis of a proposed vineyard showed significant capital expenditures necessary to establish the vineyard. The development costs prior to producing the first crop in the third year totaled $5.74 million or $14,350 per acre without any land purchase cost. These costs were primarily land preparation costs, cost of vines, costs of planting, trellis and irrigation systems and care of the young vines. Financing costs were included because of the high start-up costs.[1] After the fourth year, with the operation past the start-up phase, annual income exceeded annual cultural and harvesting costs. However, at the end of the 10th year, the net accumulated position was a negative $3.7 million because of the high start-up costs.

Sensitivity analysis showed if the price level was $1,000 per ton, it would be after the end of the tenth year before the accumulated net position became positive. At a price of $1200 per ton, it would be at the end of eighth year before accumulated income exceeded accumulated expenses.

[1] Without financing costs, the development costs would still be $12,875 per acre.

Conclusion

While the annual income exceeds the annual cultural and harvesting cost for the modeled vineyard, the inclusion of startup and financing costs create an enterprise that is not financially advisable. The planting of 400 acres of wine grapes which would be a 26% increase in the county's grape acreage is not justified given the projected returns from the enterprise, the opportunity cost of capital and the uncertainty and risk of the operation.

Respectfully,

James A. Niles

James A. Niles, Ph.D.

APPENDIX F

Add the following letter from H.T. Harvey and Associates.

H.T. HARVEY & ASSOCIATES
ECOLOGICAL CONSULTANTS

June 19, 1996

Bert Verripes
Nolte and Associates
60 South Market Street
San Jose, CA 95113

Subject: Riparian Habitat Impact Assessment at Lion's Gate Golf Course

Dear Bert,

You recently asked H.T. Harvey and Associates to reassess impacts to riparian habitat at the Lion's Gate Golf Course. Impacts were initially assessed by H.T. Harvey and Associates for the project's E.I.R. using an aerial photograph and site development plans provided by the project proponent. H.T. Harvey and Associates concluded that 1.7 acres of riparian vegetation would be removed and 0.4 acres would become "non-riparian" due to either diversion of creek flows or filling of creek channels for a total of 2.1 acres of riparian impacts. On June 14, 1996 Pat Reynolds of H.T. Harvey and Associates reevaluated impacts to riparian habitat in the field with Ron Davis of Lion's Gate Reserve.

Impacts to riparian habitat have been significantly reduced by golf course redesign and more precise measurements for the following reasons:

1. The orientation of golf course fairways were modified to avoid impacts.
2. Many dewatering impacts were eliminated by maintaining creek flows and avoiding filling of channels.
3. Impact assessment accuracy was improved with more precise measurements of riparian canopies in the field which was not possible using the aerial photograph.
4. One group of trees which appeared to be riparian on the aerial photograph was found to be in upland habitat when examined in the field.

The impact to riparian vegetation is now 0.50 acres of vegetation removal and 0.33 acres of channel dewatering for a total of 0.83 acres of impacts. Table 1 lists the species and diameters of all the riparian trees that will be removed or impacted from dewatering. Please call myself or Pat Reynolds if you have any questions.

Sincerely,

Patrick Reynolds For

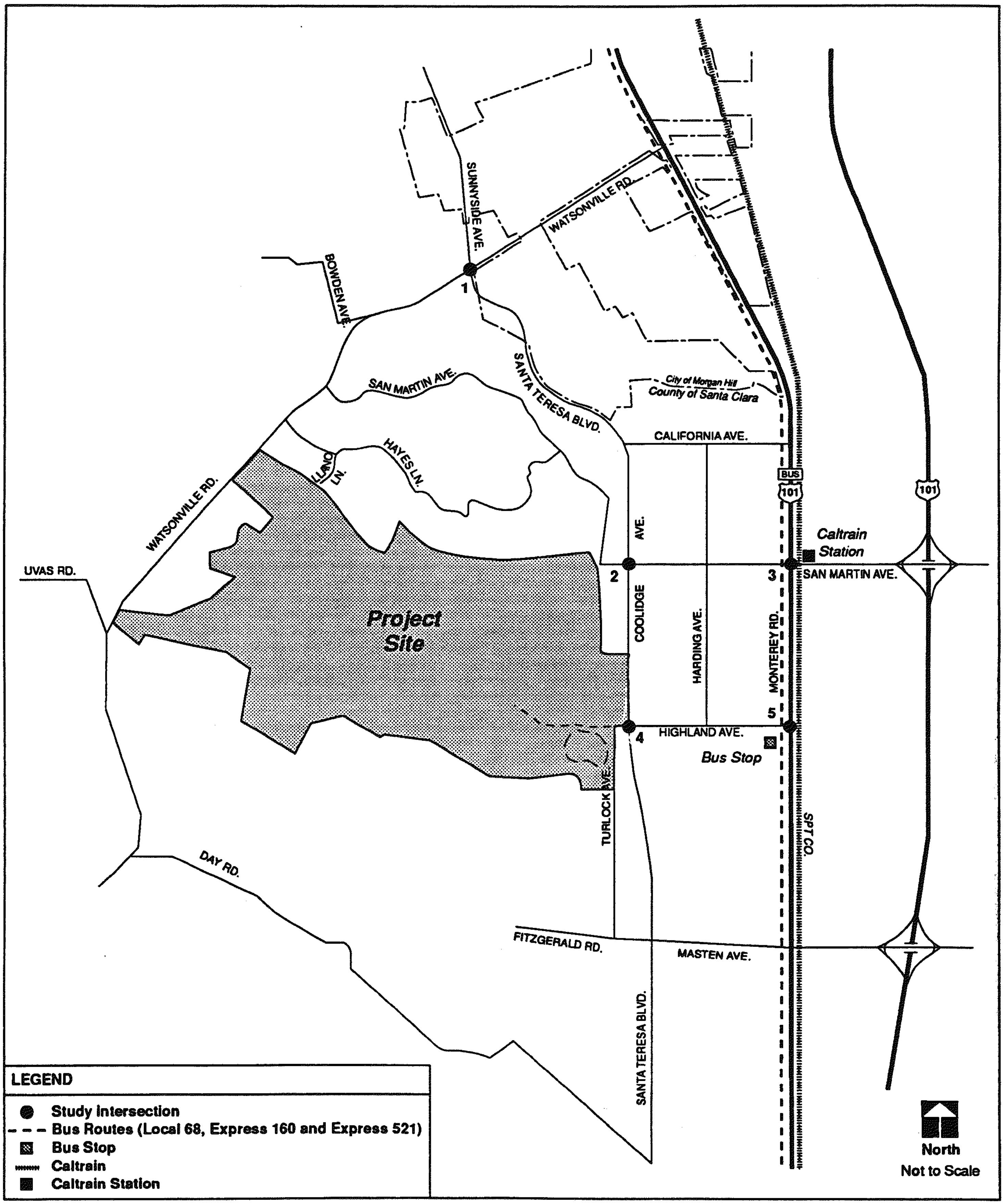
Rick Hopkins

Alviso Office
906 Elizabeth Street • P.O. Box 1180
Alviso, CA 95002 • 408-263-1814 • Fax: 408-263-3823

Fresno Office
423 West Fallbrook, Suite 207
Fresno, CA 93711 • 209-449-1423 • Fax: 209-449-8248

APPENDIX H

Add the following figures to Appendix H.



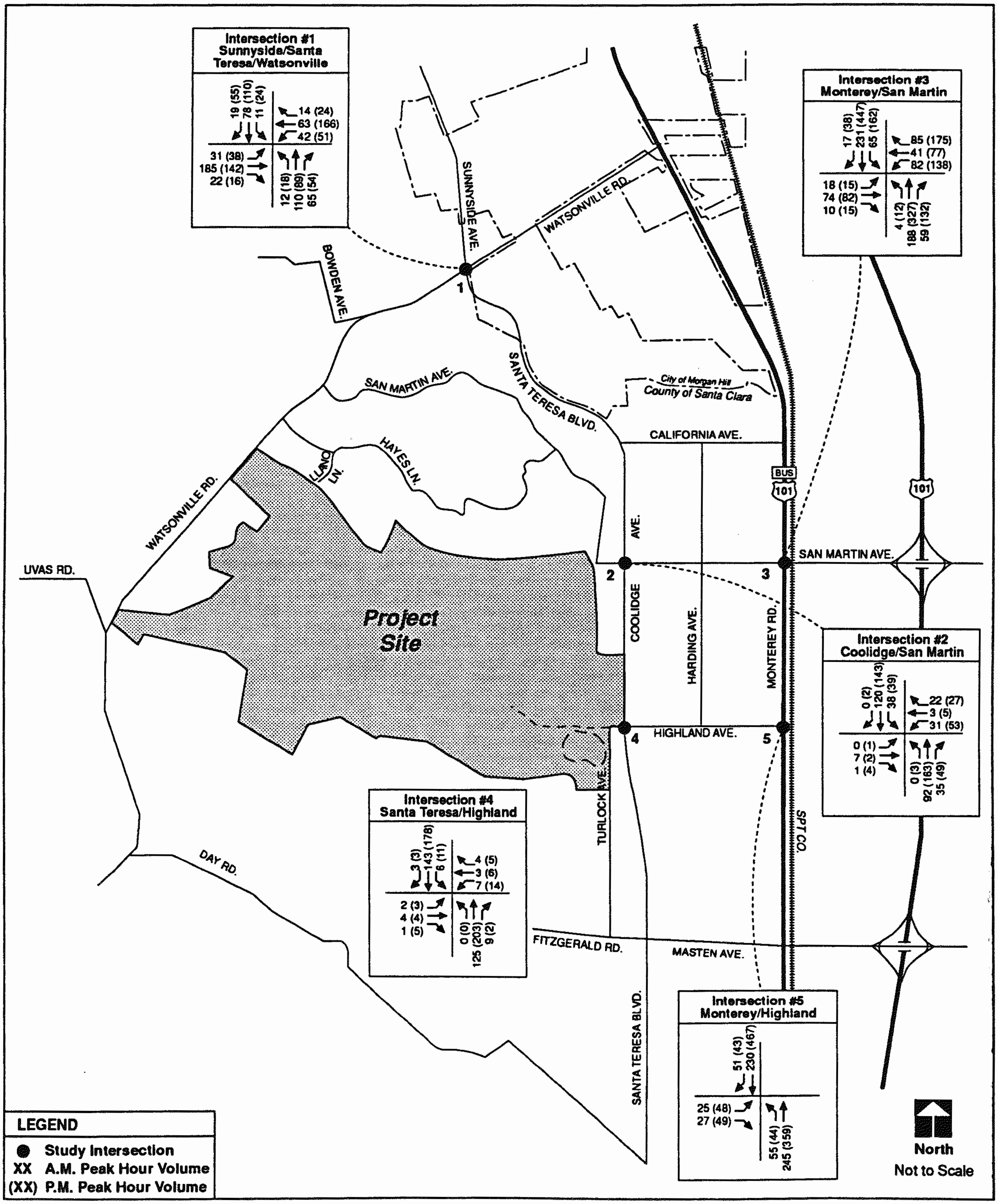
Santa Clara County
Hayes Valley TIS

Vicinity Map

Figure 1

TJKM

142-026 - 4/94 - K2



Santa Clara County
Hayes Valley TIS

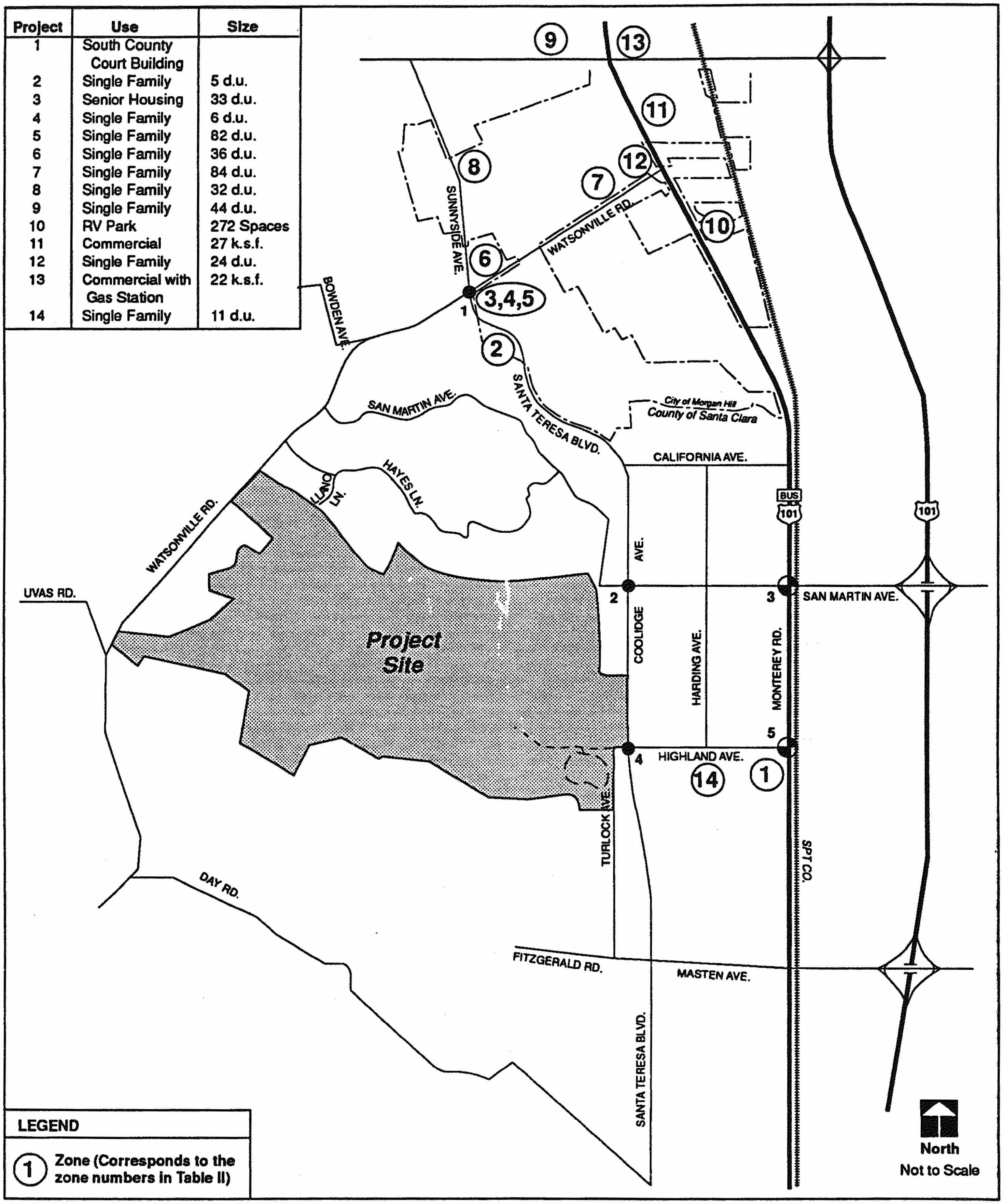
Existing Peak Hour Turning Movements

Figure 2

TJKM

142-026 - 4/94 - K2

Project	Use	Size
1	South County Court Building	
2	Single Family	5 d.u.
3	Senior Housing	33 d.u.
4	Single Family	6 d.u.
5	Single Family	82 d.u.
6	Single Family	36 d.u.
7	Single Family	84 d.u.
8	Single Family	32 d.u.
9	Single Family	44 d.u.
10	RV Park	272 Spaces
11	Commercial	27 k.s.f.
12	Single Family	24 d.u.
13	Commercial with Gas Station	22 k.s.f.
14	Single Family	11 d.u.



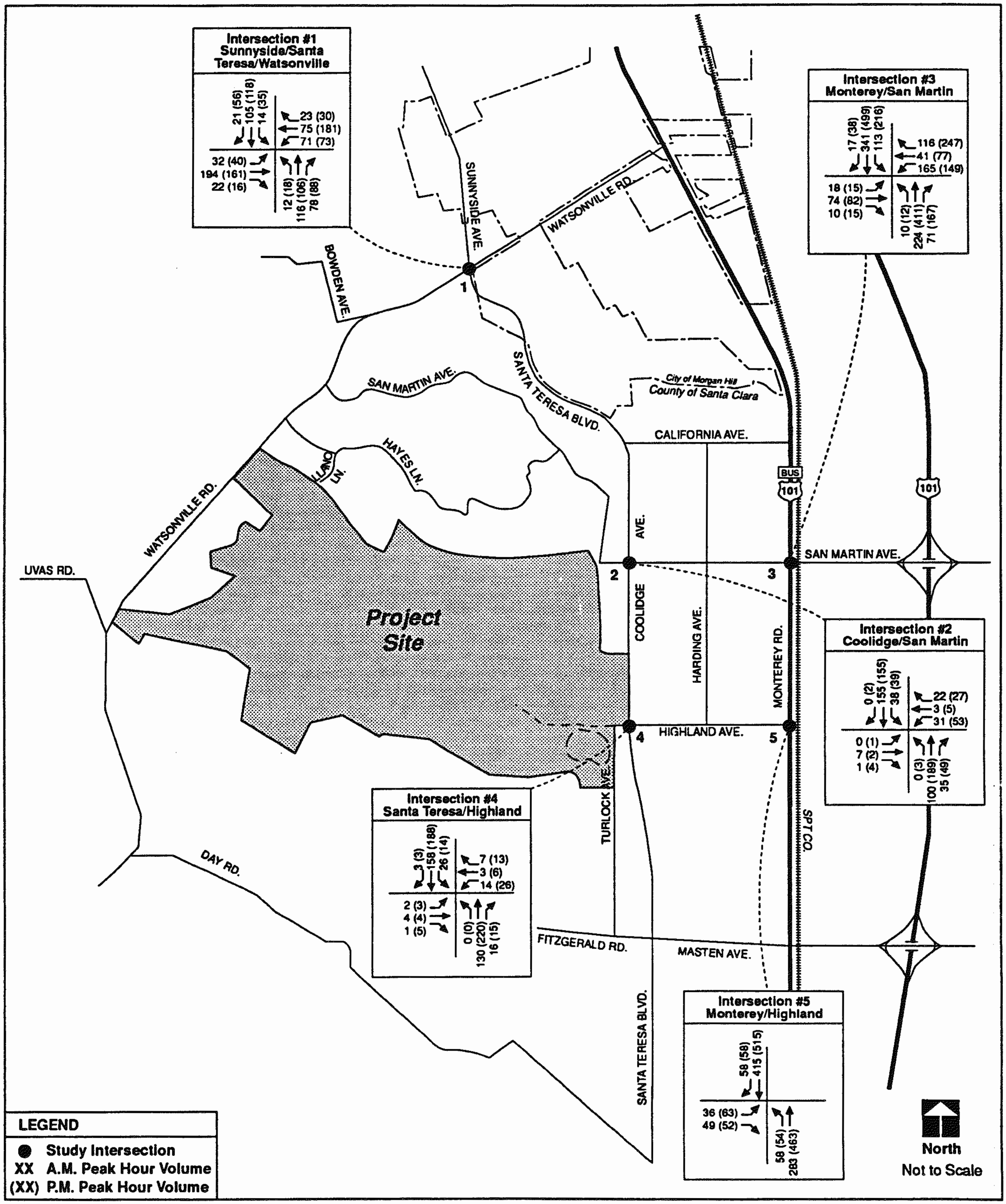
Santa Clara County
Hayes Valley TIS

Figure 3

Location of Approved Developments

TJKM

142-026 - 4/95 - K2



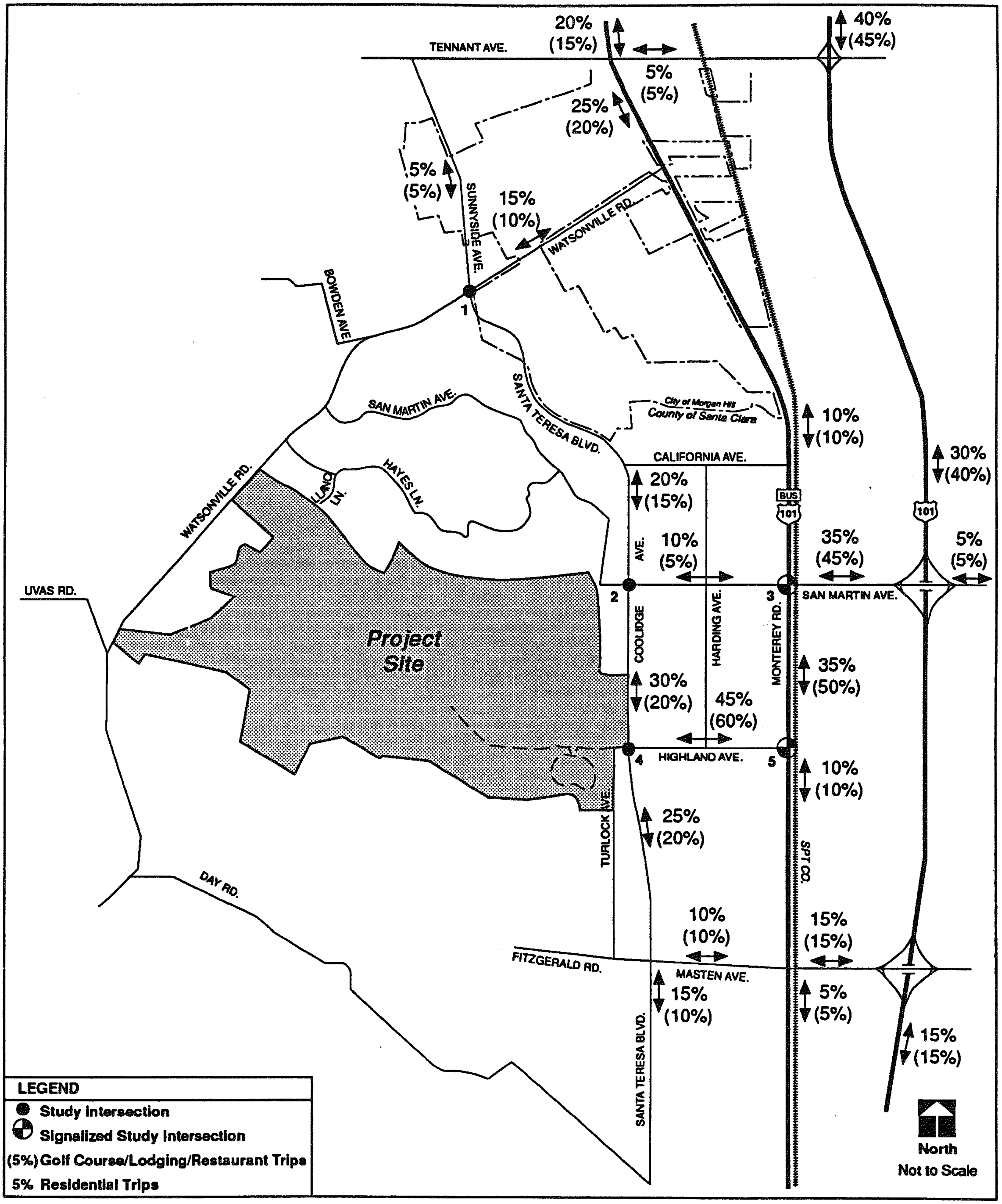
Santa Clara County
Hayes Valley TIS

Existing plus Approved Peak Hour Turning Movements

Figure 4

TJKM

142-026 - 4/95 - K2



Santa Clara County
Hayes Valley TIS

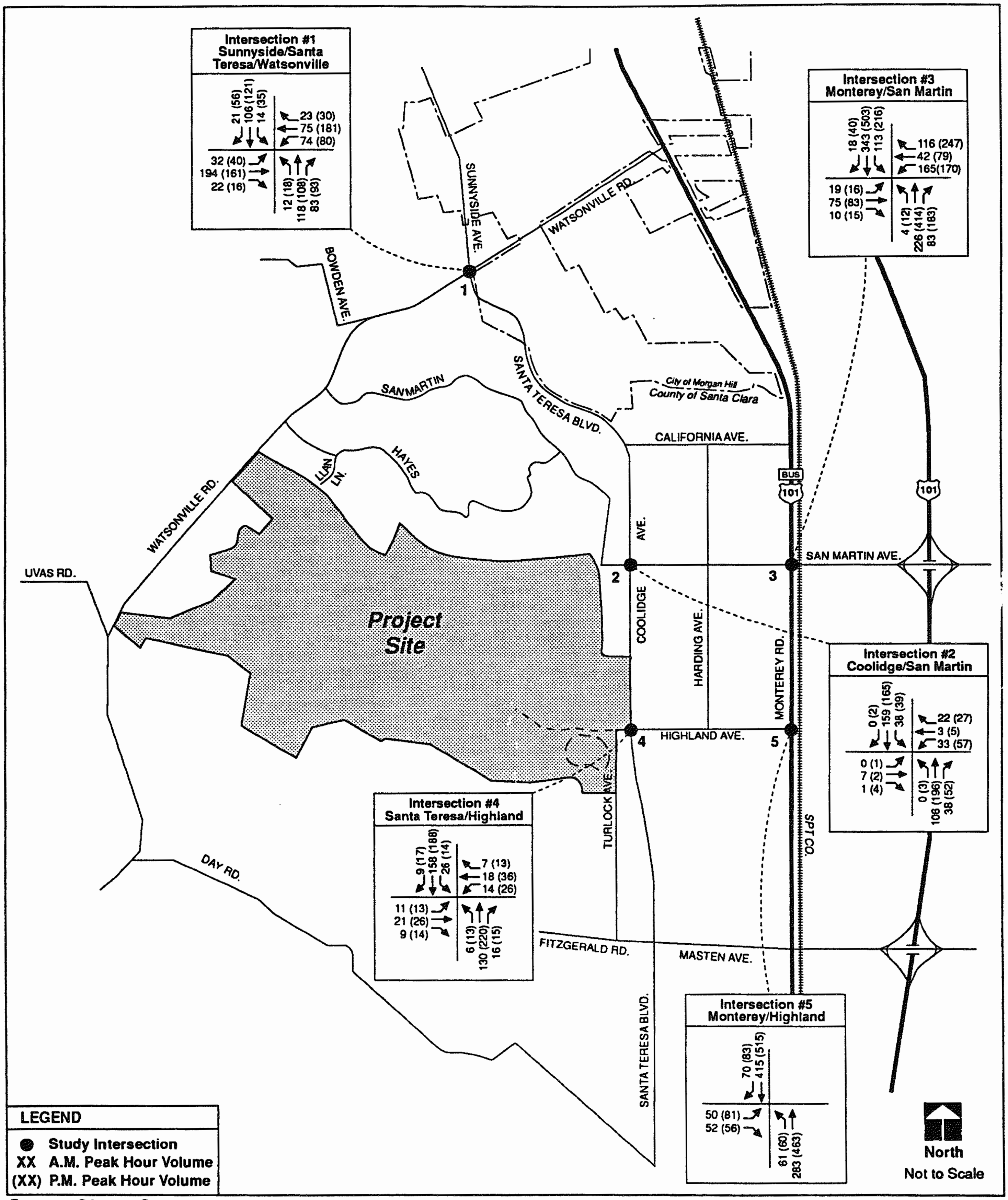
Trip Distribution

Figure

6

TJKM

142-026 - 4/94 - K2

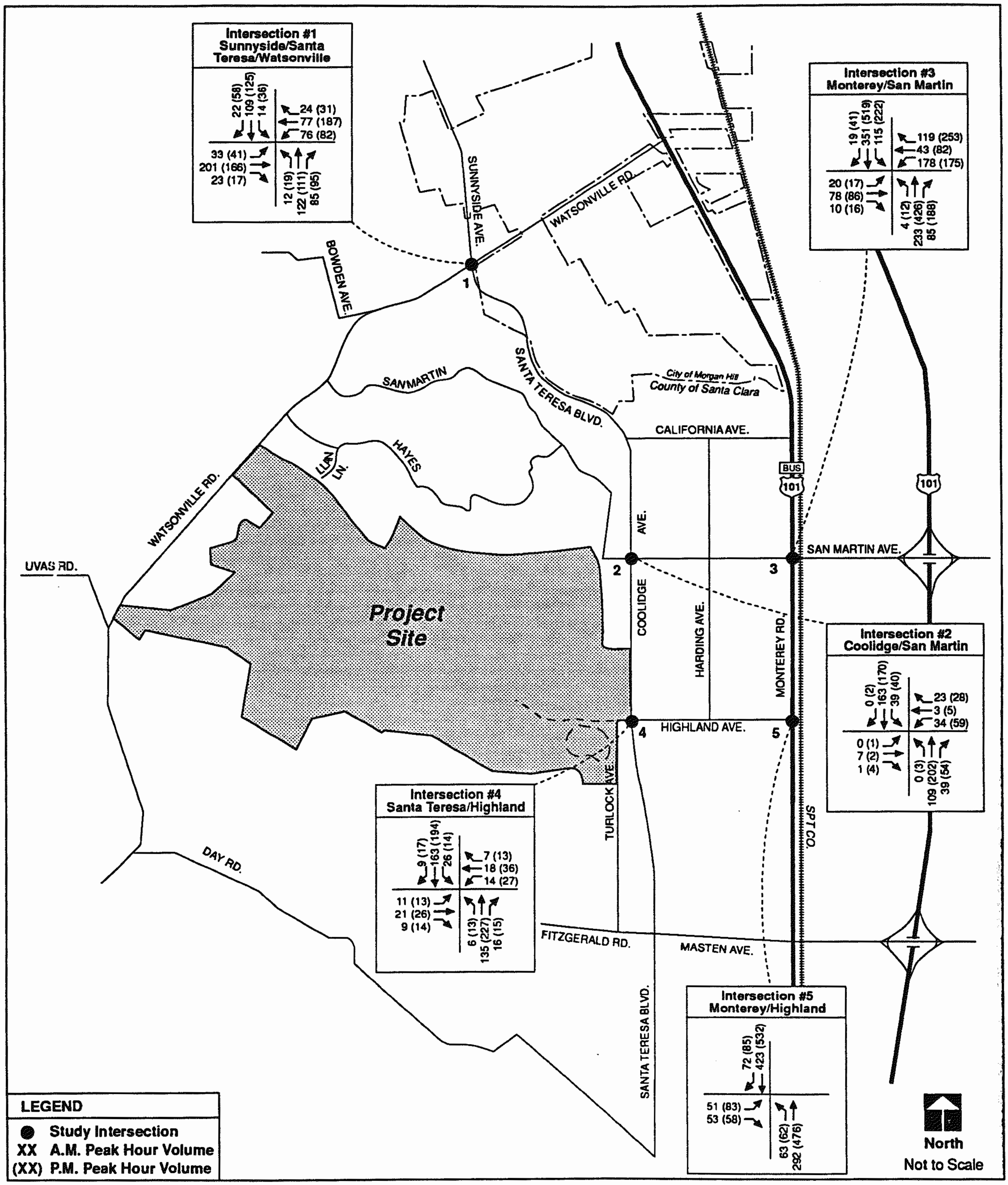


Santa Clara County
Hayes Valley TIS
Existing plus Approved plus Project Peak Hour Turning Movements

Figure 7

TJKM

142-026 - 9/95 - K2



Santa Clara County
Hayes Valley TIS

Existing plus Approved plus Project plus Expected Growth Peak Hour Turning Movements

Figure 8

TJKM

APPENDIX M

Add the following addendum letters from Geoconsultants, Inc., and West San Martin Water Works and the memo from the Santa Clara Valley Water District.

GEOCONSULTANTS, INC.
Hydrogeology • Ground-Water Exploration & Development •
Ground-Water Resources Management •
1450 Koll Circle, Suite 114
San Jose, California 95112
Phone: (408) 453-2541 Fax: (408) 453-2543

RECEIVED
MAY 29 1996
NOLTE and ASSOCIATES
SAN JOSE

May 28, 1996
Project No. G1022-01B

Mr. Tom Hix
Hayes Valley Development Partners
405 El Camino Real, Suite 127
Menlo Park, CA 94025

RE: HYDROGEOLOGIC SERVICES
LION'S GATE RESERVE
SANTA CLARA COUNTY, CALIFORNIA

Dear Mr. Hix:

In order to address in detail the on-site hydrogeologic characteristics, the following scope of work will be completed:

Initially a 24-hour aquifer test will be performed on one of the existing wells on the property. Static water levels will be measured in the pumping well, as well as a monitoring network of at least one on-site and one off-site well. Drawdown and recovery levels will be recorded on all wells during the pumping test. Based on the results of the aquifer test, calculations of transmissivity, specific capacity, and storitivity will be prepared. This information will allow us to determine the maximum radius of pumping influence. Once this has been established, a setback line can be drawn so that new on-site production wells will not impact existing off-site wells.

Once the setback line has been established, an on-site survey for the purpose of locating one or more on-site production wells will be performed. Based on the results of this survey, one or more production wells will be constructed, and the water-bearing characteristics of the formations penetrated evaluated.

A 72-hour pumping test to determine well production parameters such as specific capacity and recommended pumping rates will be performed following construction. At the conclusion of the test, we will collect a water sample for an evaluation of constituents in accordance with State and County drinking water standards.

A monitoring well network will be developed including the production well(s), other on-site wells, and appropriate off-site wells. In order to develop a water level history, measurements will be taken in each of the wells for an extended period of time. Individual well hydrographs will be developed. In addition, a precipitation gage will be installed at the site in order to develop accurate rainfall totals. This information will allow periodic updates of the aquifer characteristics, and assure that an overdraft condition will not occur.

We appreciate the opportunity to present this work program to you for this project. Please call me with any questions or comments.

Sincerely,

GEOCONSULTANTS, INC

John K. Hofer
Engineering Geologist, EG-1065

JKH:rls

(G1022pro.DOC)

WEST SAN MARTIN WATER WORKS, INC.
1005 HIGHLAND AVE. • SAN MARTIN, CALIFORNIA 95046 • 408-683-2098

June 7, 1996

Mr. Thomas Hix
Hayes Valley Development Partners
405 El Camino Real #127
Menlo Park, California 94025

Re: Lion's Gate Reserve Project

Dear Tom;

This letter shall serve to confirm the following discussion that we had regarding the water rates for the project and the status of the tank.

As we discussed, and attached hereto is a copy of the Bulk rate which West San Martin Water Works is allowed to charge for large users per our P.U.C. Tariff Schedule No. 6R. This Tariff Schedule allows us to sell water at $ 0.57 per 100 cubic feet to Lion's Gate for golf course irrigation. This rate is approximately 60 to 65 per cent less than the rate we charge for general customer service per our Tariff Schedule No. 1, which is currently $ 1.36 per 100 cubic feet for the first 300 cubic feet and $ 1.61 per 100 cubic feet over 300 cubic feet of water.

As we discussed, WSMWW has more than sufficient capacity in our existing wells to accommodate any water needs the golf course may have. It is my understanding that you will use ground water from the site as your primary source for golf course irrigation, and supplement the needs from both WSMWW and Twin Valley so that you do not draw more than a safe yield from your own aquifer. Based on this approach, I see absolutely no problem in satisfying your water demands.

With respect to the new storage tank, WSMWW is currently in the engineering design phase and we expect to commence construction in the spring of 1997. The tank will be fully operational prior to the spring of 1998, which is when we understand that the Lion's Gate project will be completed.

Please feel free to call upon me if I can be of any further assistance.

Sincerely,

Bob Ukestad

Bob Ukestad, Manager
West San Martin Water Works, Inc.

TRANSMITTER USE ONLY
☐ Sent
JG Initials
6/27 Date
1:15 Time

Santa Clara Valley Water District
5750 Almaden Expressway, San Jose, CA 95118, (408) 265-2600

FAX NUMBER: (408) 266-0271

FAX TRANSMISSION

PLEASE NOTE: If the same FAX transmission is being sent to more than one company and/or agency, please provide required information.

Date: 6/27/96

To	Company or Agency	FAX Number
Bert Verrips	Nolte & Assocs	267-6906
		298-2719
Hugh Graham	S.C. County Planning	279-8537

From: Sue Tippets

REFERENCE:

Project #:	Total Pages (Including Coversheet): 3	☐ Original will follow by:

MESSAGE:

Disk: Miscellaneous - 5; EIRs (black)
filename: \eir\hayes-3.wpd
Word Perfect for Windows 6.0

June 26, 1996

To: Sue Tippets
From: Seena Hoose
Subject: Lion's Gate Development in Hayes Valley, Sustainable Water Supply

My analysis used the quantities included in the EIR and related documents provided to me by the project proponents, confidential information available through the District's well section and drilling logs, the District's depth to water program, and the 1973 Wahler report on Hayes Valley as a potential reservoir site.

The plan proposes to obtain water from three sources, 1) on-site groundwater, 2) Twin Valley Inc., and 3) West San Martin Water Works, Inc.

The demand projection is 410.8 acre-feet per year, of which 374.1 acre-feet are for golf course irrigation. However, the majority of that demand will occur during the summer, assuming 150 days at the peak demand rate the project will use 363.9 acre-feet during the 5 summer months.

The estimated availability of on-site groundwater is 313 acre-feet a year. This leaves an annual shortage of 97.8 acre-feet. Project proponents plan to augment the on-site groundwater from Twin Valley and West San Martin. First I will examine the on-site supply and the effects of it's use, then the other two water sources.

On-site Groundwater

The Hayes Valley aquifer is within the alluvium filling the valley floor. The assumption was made that the average saturated thickness of the aquifer is 50 feet. The 1973 Wahler report indicates that the bedrock beneath the alluvium is a very irregular surface. Thus, the groundwater will be compartmentalized and it may be very difficult to obtain the proposed yield because of boundary effects and drawdown problems within the wells. The faults crossing the valley floor may also operate as barriers to groundwater movement to wells. Therefore, although the generalized assumptions were conservative, the on-site groundwater may not be fully available, particularly during the summer period of peak golf course watering.

The Hayes Valley aquifer materials are directly connected to the Llagas groundwater basin at the eastern end of the valley. At the present time Hayes Valley groundwater naturally migrates into the Llagas basin. There are over 45 wells, mostly private, within about 4,000 feet of the end of Hayes Valley. The Llagas groundwater basin appears to be relatively shallow, about 200 feet thick, in that area. The groundwater use on-site will significantly reduce the amount of water migrating from Hayes Valley into the Llagas basin. The possibility exists that this could compound declines in water levels due to pumping, particularly during drought conditions.

Project proponents have stated that they will monitor groundwater levels. They have also indicated that during drought conditions they will significantly curtail water use, particularly at the golf course.

The groundwater close to the west side of the Llagas basin, and in the vicinity of Hayes Valley has been impacted by nitrate contamination. The water quality in this part of the groundwater basin needs to be monitored to verify that the reduction of inflow from Hayes Valley groundwater does not have an adverse impact.

Twin Valley, Inc.

The available water from Twin Valley, Inc. is estimated at 16 acre-feet per year. The water is taken from the mountain valley alluvial aquifer along Hayes Creek at the north edge of Hayes Valley. The wells are in the general vicinity of Watsonville Road and Sycamore Road. This groundwater is contaminated with nitrate. Twin Valley has installed 2 new wells. One well, in serpentine bedrock yields 30 gpm. The other well log has not yet been submitted to the District as legally required. Until the new operations are established, and the impacts upon this very limited aquifer are known, it is best not to rely on this source of water. There are over 60 private wells in the immediate vicinity of the project.

West San Martin Water Works, Inc.

The conservative estimate indicated an availability of 599 acre feet as inflow from other parts of the Llagas groundwater basin, and 184 acre-feet from rainfall recharge. The West San Martin wells are located in downtown San Martin and near Llagas Creek. West San Martin Water Works is supplying about 235 acre-feet annually to their current customers. It does appear that they will be able to supply the additional 100 to 200 acre-feet annually needed for the project. It remains important that water for the project be piped from near the center of the valley and not be drawn from groundwater along the west side of the Llagas groundwater basin.

General Information

The District projects identified in the EIR are not going to be constructed. In particular, it was determined that the location at Maple Avenue is not suitable for recharge ponds.

SEE NEXT PAGE

During discussion with the Project EIR writer we identified that the EIR had not listed a rare mineral occurrence on the property. POPPY JASPER has been quarried on the Hayes Valley Ranch. The Poppy Jasper locality in one of only two known occurrences in the world. The mineral locality should be identified and protected during and after development of the site.

Tom Iwamura suggested the consideration of a Special Pump Tax Zone because the groundwater is being pumped from the basin and used in an upland area. There is precedent for this in other projects, such as United Technologies Corporation which pumps water from the Coyote valley and brings it over the mountain to their site.

Note from EIR Preparer regarding Poppy Jasper

The preceding memo from the Santa Clara Valley Water District makes a reference, at page 2, to Poppy Jasper being present on the property. In response, local geologist Peter Anderson of Pacific Geotechnical Engineering was consulted regarding this issue. Mr. Anderson stated it was unlikely that the deposit was located within the present boundaries of the site. However, there is strong reason to believe that the source is present within the Hayes Ranch estates development, which is adjacent to the Lion's Gate site to the north.